
FOR BUS SECTION BAY
GIS BAY REF. = D120

- Required Material For Interface Work :-
- New terminal Block -X100 (SH: 36, 15, 43)

132kV GIS LCC
SCHEMATIC DRAWINGS

SUBSTATION 8709

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DRAWN BY D.H.HAN		CHECKED BY C.Y.HONG		DATE STARTED 10.JULY.12		DATE COMPLETED		CONTRACT NO. 11131113/00		INDEX P		PLANT NO. C421		DRAWING NUMBER CA -323947	
00		10.JULY.12		FOR APPROVAL		OPRG. DEPT.		ENG. DEPT.		SHEET NO. 01 of 47A		NEXT 02		REV. NO. 00	
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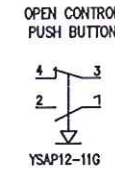
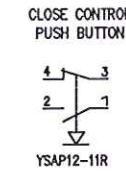
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1.LEGEND OF SYMBOLS

	M	MINIATURE CIRCUIT BREAKER		S	BREAK CONTACT GAS DENSITY METER		CT	CURRENT TRANSFORMER
	F	THERMAL RELAY		S	REED BREAKING CONTACT NOT OPERATED		VT	VOLTAGE TRANSFORMER
	S	LATE MAKE CONTACT		-	MOTOR OPERATED			
	S	EARLY BREAK CONTACT		-	EARTH			
	S	EARLY MAKE CONTACT		Y	OPERATING MAGNET COIL			
	S	LATE BREAK CONTACT		M	MOTOR AC 3 PHASE			
	S	CHANGE OVER SWITCH		T	RELAY SLOW OPERATING			
	S	PUSH BUTTON MAKE CONTACT		-	OP-AMP			
	S	PUSH BUTTON BREAK CONTACT		P	CONNECTING POINT CT'S			
	S	DOOR SWITCH		T	MAKE CONTACT DELAYED WHEN OPERATING			
	S	BLOCKING CONTACT		T	BREAK CONTACT DELAYED WHEN OPERATING			
	-	CHANGE OVER CONTACT OPERATED BY UNDER PRESSURE		T	MAKE CONTACT DELAYED WHEN RELEASING			
	S	CONTROL SWITCH		T	BREAK CONTACT DELAYED WHEN RELEASING			
	S	MAKE CONTACT GAS DENSITY METER						

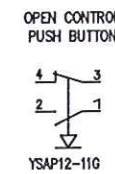
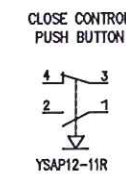
	K	RELAY		-	DISCONNECT WITH MOTOR MECHANISM			
	K	FLAG RELAY		-	EARTH SWITCH WITH MOTOR MECHANISM			
	Y	CLOSING OR TRIPPING COIL		-	CIRCUIT BREAKER			
	P	PULSE COUNTER		CT	CURRENT TRANSFORMER			
	K	LATCHING RELAY		-	CABLE HEAD			
	M	DC - MOTOR		-	BUSHING			
	-	ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET		VTL	3 PHASE INDUCTIVE TYPE VOLTAGE TRANSFORMER			
	H	ANNUNCIATOR		-	TERMINAL (NORMAL TYPE)			
	-	OPTO - COUPLER		-	TERMINAL (KNIFE TYPE)			
	R	RESISTOR		IT	ISOLATING TERMINAL			
	D	RECTIFYING FUNCTION		-	BRIDGE OVER TERMINALS			
	H	SIGNAL LAMP & DISCREPANCY SWITCH LAMP		-	SEPARATE PLATE NEXT TO TERMINALS			
	E	FLUORESCENT LAMP		-	GAS GAUGE (GAS FILLED STATE)			
	H	DISCREPANCY SWITCH LAMP (FOR CB)						

2.DETAIL OF CONTROL SWITCHES



DETAIL OF CONTROL SWITCHES FOR DS/ES

CONTACT	OFF	ON	FUNCTION
1-2		X	OPEN
3-4	X		CLOSE

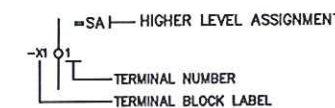


DETAIL OF CONTROL SWITCH FOR CB

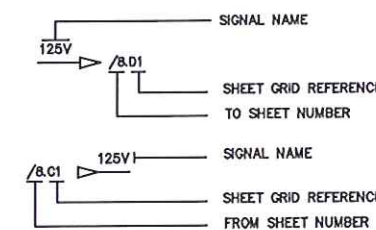
CONTACT	OFF	ON	FUNCTION
1-2		X	OPEN
3-4	X		CLOSE

3.DRAWING PRINCIPLES

PRESENTATION OF TERMINALS



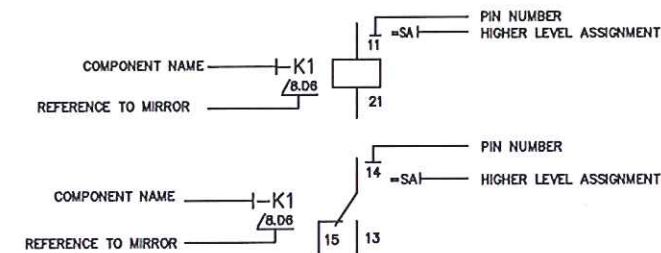
PRESENTATION OF SHEET TO SHEET REFERENCE



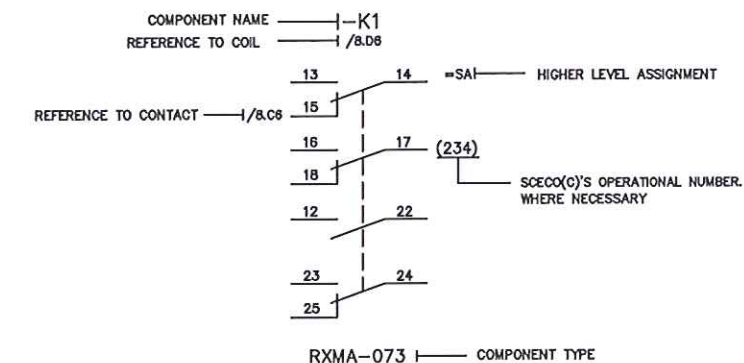
PRESENTATION ...



PRESENTATION OF COMPONENTS



5. PRESENTATION OF THE MIRROR

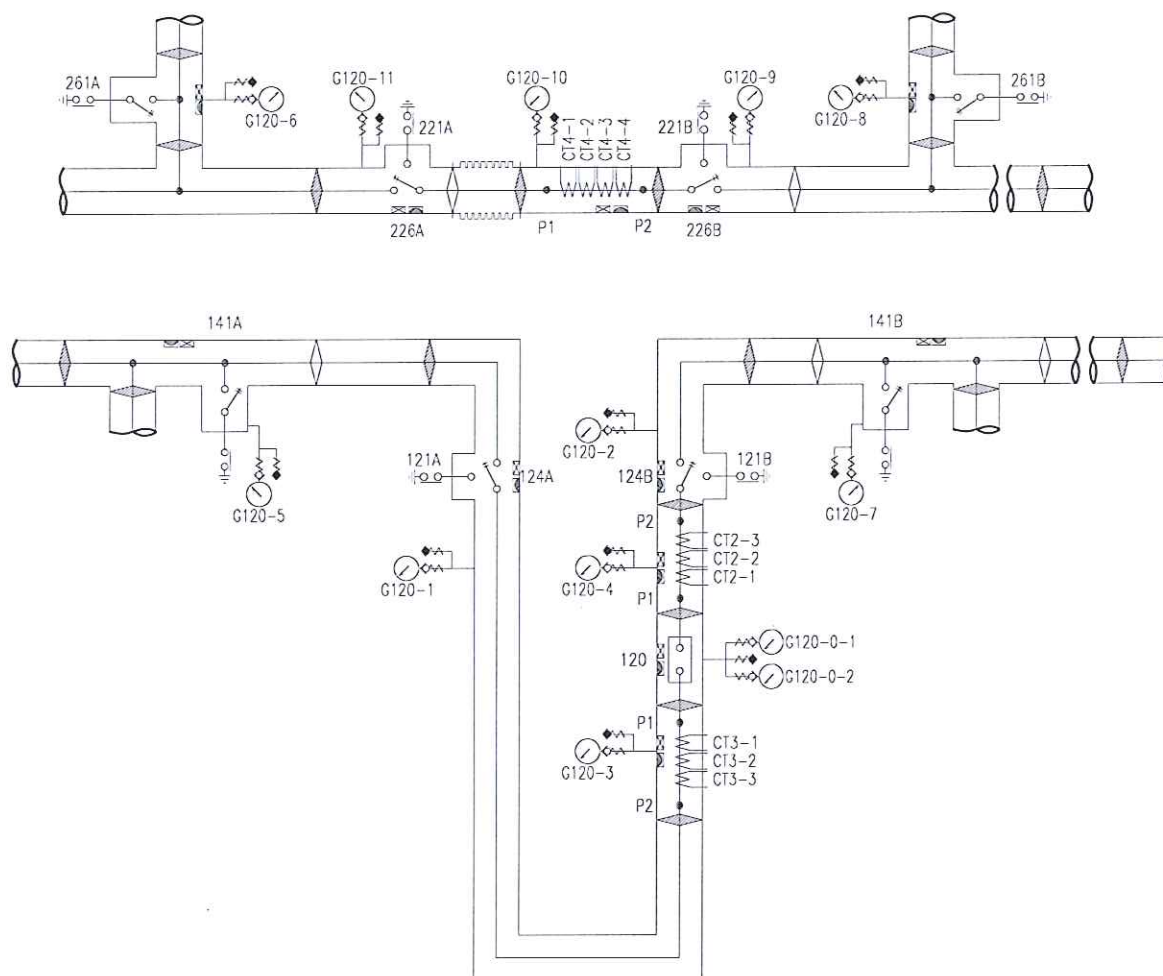


AS-BUILT	BY	DATE
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SEC-COA 132kV/13.8kV SUBSTATION #8709
LEGEND OF SYMBOLS
LCC SCHEMATICS FOR D120 BUS SECTION BAY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء	نقل الكهرباء	سHEET NO. 03 of 47A
CONTRACT NO. 11131113/00	INDEX P	PLANT NO. C421
DRAWING NUMBER CA-323947	REV. NO. 00	



BUS SECTION
(120)

1. RATED SF6 GAS PRESSURE
CB=600 kPa (at 20°C)
MAIN BUS=400 kPa (at 20°C)
OTHERS=400 kPa (at 20°C)

2. SETTING PRESSURE (at 20°C) OF DENSITY DETECTOR IS AS FOLLOWS

EQUIPMENT	SF6 GAS PRESSURE at 20°C degree	DESCRIPTION
CB	800 kPa	HIGH PRESSURE ALARM
	550 kPa	FIRST STAGE LEAK ALARM (REFILLING STAGE)
	500 kPa	SECOND STAGE LEAK ALARM (PRESSURE FAILURE)
OTHERS (DS, ES, CT, VT, BUS, etc)	500 kPa	HIGH PRESSURE ALARM
	370 kPa	FIRST STAGE LEAK ALARM (REFILLING STAGE)
	350 kPa	SECOND STAGE LEAK ALARM (PRESSURE FAILURE)

* ACCURACY RANGE : ±1% at 20°C, ±2.5% at -20°C ~ 60°C

3. GAS SECTION NUMBER OF GAS MONITORING IS AS FOLLOWS

DESCRIPTION
$\frac{G \times X - X}{GIS \text{ BAY No.}} - \frac{X}{\text{GAS COMPARTMENT No.}}$

4. BURSTING PRESSURE OF PRESSURE RELIEF DEVICE

CB = 1500 kPa
OTHERS = 1000 kPa

LEGEND

SYMBOL	REMARK
	NON-RETURN VALVE (normally open)
	NON-RETURN VALVE (normally closed)
	GAS PRESSURE GAUGE
	INSULATION 141BCER (GAS TIGHT)
	INSULATION 141BCER (GAS THROUGH)
	ABSORBENT ZEORAM
	RUPTURE DISC
	CIRCUIT BREAKER
	CURRENT TRANSFORMER
	VOLTAGE TRANSFORMER

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SEC-COA 132kV/13.8kV SUBSTATION #8709
GAS SCHEME DIAGRAM
LCC SCHEMATICS FOR D120 BUS SECTION BAY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء	نقل الكهرباء	سHEET NO. 04 of 47A
CONTRACT NO. 11131113/00	INDEX P	PLANT NO. C421
DRAWING NUMBER CA -323947	REV. NO. 00	

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A			SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION
			1	-F0	MANIATURE CIRCUIT BREAKER, DOUBLE POLE 16A, SHUNT TRIP FOR ES/DS MOTOR PROTECTION	/14.B8	1	S202P-K16+S2C-A2 +S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0002 + 2CES200912R0001
			2	-F0A	MANIATURE CIRCUIT BREAKER, DOUBLE POLE 16A, SHUNT TRIP FOR ES/DS MOTOR PROTECTION	/14.E8	1	S202P-K16+S2C-A2 +S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0002 + 2CES200912R0001
			3	-F1	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSABR EARTH SWITCH(261A) MOTOR DC SUPPLY	/14.B8	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			4	-F2	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSABR EARTH SWITCH(261B) MOTOR DC SUPPLY	/14.B9	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			5	-F3	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSBAR DISCONNECTOR WITH EARTH SWITCH(226A/221A) MOTOR DC SUPPLY	/14.B10	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			6	-F4	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSBAR DISCONNECTOR WITH EARTH SWITCH(226B/221B) MOTOR DC SUPPLY	/14.C8	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
B			7	-F5	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR DS / ES DC CONTROL SUPPLY FOR FRONT BUSBAR	/14.C8	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
			8	-F8	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR SIGNALING ALARMS DC SUPPLY	/15.B7	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
			9	-F9	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 16A FOR CB(120) PUMP MOTOR DC CONTROL SUPPLY	/15.B8	1	S202P-K16 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0001 *2
			10	-F10	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 16A FOR CB(120) ANTIPUMPING DC CONTROL SUPPLY	/15.B9	1	S202P-K16 +S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0001
			11	-F11	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 16A FOR CB(120) CLOSING / OPENING OPERATIONS DC SUPPLY	/15.B10	1	S202P-K16 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0001 *2
C			12	-F12	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 16A FOR CB(120) TRIP CIRCUIT 1 DC SUPPLY	/15.F7	1	S202P-K16 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0001 *2
			13	-F13	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 16A FOR CB(120) TRIP CIRCUIT 2 DC SUPPLY	/15.F9	1	S202P-K16 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0467 + 2CES200912R0001 *2
			14	-F14	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR ANNUNCIATOR AC 220V SUPPLY	/13.D2	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
			15	-F15	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR LCC LIGHTING AC 220V SUPPLY	/13.D3	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
			16	-F16	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSBAR DISCONNECTOR WITH EARTH SWITCH(124A/121A) MOTOR DC SUPPLY	/14.E8	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			17	-F17	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSBAR DISCONNECTOR WITH EARTH SWITCH(124B/121B) MOTOR DC SUPPLY	/14.E9	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
D			18	-F18	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSABR EARTH SWITCH(141A) MOTOR DC SUPPLY	/14.F8	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			19	-F19	MINIATURE CIRCUIT BREAKER,1NO+1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BUSABR EARTH SWITCH(141B) MOTOR DC SUPPLY	/14.F9	1	S202P-K6+S2C-H6R +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *3
			20	-F20	MINIATURE CIRCUIT BREAKER,1NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR POWER SOCKET AC 127V SUPPLY	/13.F2	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
			21	-F50	THERMAL RELAY FOR CB SPRING CHARGING MOTOR. SETTING RANGE 10A	/20.E6	1	MT	LS	MT-L8.5
			22	-E1,-E2	FLUORESCENCE LAMP. AC 220V. 20W	/13.D3/13.D4	2		J-SUNG-ELEC.CO	
E			23	-H1	ANNUNCIATOR FOR LCC AND SIGNALING TO CONTROL ROOM VOLTAGE 125VDC & 220VAC , SILENCE / ACKNOWLEDGE / RESET OPTIONS, TESTING OPTION. DELAY OPTIONS 5ms TO 5s , 32 INPUT/OUTPUT	/44.A4	1	UC725	RTK	UC625-32YW-HH-024-R-M3
			24	-H2	ANNUNCIATOR FOR LCC AND SIGNALING TO CONTROL ROOM VOLTAGE 125VDC & 220VAC , SILENCE / ACKNOWLEDGE / RESET OPTIONS, TESTING OPTION. DELAY OPTIONS 5ms TO 5s , 32 INPUT/OUTPUT	/44.A4	1	UC725	RTK	UC625-32YW-HH-024-R-M3
			25	-H3	ANNUNCIATOR FOR LCC AND SIGNALING TO CONTROL ROOM VOLTAGE 125VDC & 220VAC , SILENCE / ACKNOWLEDGE / RESET OPTIONS, TESTING OPTION. DELAY OPTIONS 5ms TO 5s , 32 INPUT/OUTPUT	/44.A4	1	UC725	RTK	UC625-32YW-HH-024-R-M3
			26	-H40	SIGNALING LAMP FOR LOCAL CONTROL,LED TYPE,YELLOW LAMP,WHITE CAP,25# DC 125V/24V	/16.D3	1	KGPH	KG AUTO	KGPH-D1Y/W
			27	-H50	SIGNALING LAMP FOR LOCAL CONTROL,LED TYPE,YELLOW LAMP,WHITE CAP,25# DC 125V/24V	/16.D3	1	KGPH	KG AUTO	KGPH-D1Y/W
F			28	-K2	SIGNAL FLAG RELAY WITH ZERO VOLTAGE FOR DC VOLTAGE SUPPLY SUPERVISION 1NO+2NC AUXILIARY CONTACT, SELF RESET	/14.C9,/15.C7	1	RXSFI	ABB	RK 271 019-AN
			29	-K3	SIGNAL FLAG RELAY WITH ZERO VOLTAGE FOR DC VOLTAGE SUPPLY SUPERVISION 1NO+2NC AUXILIARY CONTACT, SELF RESET	/15.F8,F10	1	RXSFI	ABB	RK 271 019-AN
			30	-K4	SIGNAL FLAG RELAY WITH ZERO VOLTAGE FOR DC VOLTAGE SUPPLY SUPERVISION 1NO+2NC AUXILIARY CONTACT, SELF RESET	/14.F9,/34.E10	1	RXSFI	ABB	RK 271 019-AN
			31	-K6,-K6A	AUXILIARY RELAY FOR LAMP TEST, POWER CONSUMPTION 5W, DC 125V, 4NO CONTACT WITH 4NO AUXILIARY CONTACT	/16.E2	2	MR	LS	MR-4D(40)+UA-4(40)
G	AS-BUILT		BY _____		DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709			
							LIST OF APPARATUS, LCC			
							LCC SCHEMATICS FOR D120 BUS SECTION BAY			
							RIYADH SAUDI ARABIA			
							11131113/00 P C421 CA -323947 00			
							CONTRACT NO. INDEX PLANT NO. DRAWING NUMBER			
							11131113/00 P C421 CA -323947 00			
							REV. NO. DATE DESCRIPTION			
							00 10.JULY.12 FOR APPROVAL			
							OPRG. DEPT. _____ ENG. DEPT. _____			
							DRAWN BY D.H.HAN CHECKED BY C.Y.HONG			
							DATE STARTED 10.JULY.12 DATE COMPLETED _____			

1	2	3	4	5	6	7	8	9	10
		SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QT'Y	TYPE	MAKER	ORDERING INFORMATION
A		32	-K7,-K7A	AUXILIARY RELAY FOR LAMP TEST, POWER CONSUMPTION 5W, DC 125V, 4NO WITH AUXILIARY CONTACT, 4NO	/16.E2	2	MR	LS	MR-4D(40)+UA-4(40)
		33	-K8	SIGNAL FLAG RELAY WITH ZERO VOLTAGE FOR DC VOLTAGE SUPPLY SUPERVISION 1NO+2NC AUXILIARY CONTACT, SELF RESET	/29.F10	1	RXSFI	ABB	RK 271019-AN
		34	-K9	SIGNAL FLAG RELAY WITH ZERO VOLTAGE FOR POWER SUPPLY 1NO+2NC AUXILIARY CONTACT, SELF RESET	/33.F4	1	RXSFI	ABB	RK 271019-AN
		35	-K11	CONTACTOR FOR BUSBAR DISCONNECTOR (124A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/21.F7	1	MC	LS	MC-9b+UA-4(31)
B		36	-K12	CONTACTOR FOR BUSBAR DISCONNECTOR (124A) CONTROLLING, OPEN OPERATION DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/21.F8	1	MC	LS	MC-9b+UA-4(31)
		37	-K14C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,124A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/28.C1	1	MR	LS	MR-4D(31)+UA-4(40)
		38	-K140	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,124A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/28.C5	3	MR	LS	MR-4D(31)+UA-4(40)
		39	-T14	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/28.B4	1	H3CR	OMRON	H3CR-A8
C		40	-K21	CONTACTOR FOR MAINTENANCE EARTH SWITCH (121A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/21.F9	1	MC	LS	MC-9b+UA-4(22)
		41	-K22	CONTACTOR FOR MAINTENANCE EARTH SWITCH (121A) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/21.F10	1	MC	LS	MC-9b+UA-4(22)
		42	-K31	CONTACTOR FOR BUSBAR DISCONNECTOR (124B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/22.F7	1	MC	LS	MC-9b+UA-4(31)
		43	-K32	CONTACTOR FOR BUSBAR DISCONNECTOR (124B) CONTROLLING, OPEN OPERATION DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/22.F8	1	MC	LS	MC-9b+UA-4(31)
D		44	-K34C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,124B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/28.C6	1	MR	LS	MR-4D(31)+UA-4(40)
		45	-K340	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,124B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/28.C9	3	MR	LS	MR-4D(31)+UA-4(40)
		46	-T34	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/28.B8	1	H3CR	OMRON	H3CR-A8
		47	-K41	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/22.F9	1	MC	LS	MC-9b+UA-4(22)
E		48	-K42	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221B) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/22.F10	1	MC	LS	MC-9b+UA-4(22)
		49	-K51	AUXILIARY RELAY FOR CONTROL CIRCUIT OF CIRCUIT BREAKER (120), POWER CONSUMPTION 5W, DC 125V,2NO+2NC	/34.E1	1	MR	LS	MR-4D(22)
		50	-K52	AUXILIARY RELAY FOR CONTROL CIRCUIT OF CIRCUIT BREAKER (120), POWER CONSUMPTION 5W, DC 125V, 2NO+2NC	/34.E2	1	MR	LS	MR-4D(22)
		51	-K43	AUXILIARY RELAY FOR CHECKING MOTOR OVER-TIME RUNNING (ABOVE 15MIN), POWER CONSUMPTION 5W, DC 125V, 2NO+2NC	/20.E7	1	MR	LS	MR-4D(22)+UA-4(22)
		52	-K44	CONTACTOR FOR MOTOR OF CB,POWER CONSUMPTION 5W, DC 125V,4NO+1NC	/20.E8	1	MC	LS	MC-22
F		53	-K37	AUXILIARY RELAY FOR ANTI-PUMPING OF CIRCUIT BREAKER (120), POWER CONSUMPTION 9W, DC 125V, 2NO+2NC	/33.F2	1	HMT	HYUNDAI	HMT22(22)
		54	-K45	AUXILIARY RELAY FOR CB GAS PRESSURE COLSING LOCKOUT(550 kPa) POWER CONSUMPTION 5W, DC 125V, 2NO+2NC	/33.F5	1	MR	LS	MR-4D(22)+UA-2(02)
		55	-K46	AUXILIARY RELAY FOR CB GAS PRESSURE TRIPPING LOCKOUT (TRIP COIL1, 550 kPa) POWER CONSUMPTION 5W DC 125V, 2NO+2NC	/33.F6	1	MR	LS	MR-4D(22)+UA-2(02)
		56	-K47	AUXILIARY RELAY FOR CB GAS PRESSURE TRIPPING LOCKOUT (TRIP COIL2, 550 kPa) POWER CONSUMPTION 5W DC 125V, 2NO+2NC	/33.F9	1	MR	LS	MR-4D(22)+UA-2(02)
G	AS-BUILT	BY	DATE	SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء	
				LIST OF APPARATUS, LCC				نقل الكهرباء National Grid sa	
				LCC SCHEMATICS FOR D120 BUS SECTION BAY				CONTRACT NO. INDEX PLANT NO. DRAWING NUMBER	
				RIYADH SAUDI ARABIA				11131113/00 P C421 CA -323947	
	00	10.JULY.12	FOR APPROVAL	DRAWN BY D.H.HAN CHECKED BY C.Y.HONG				SHEET NO. 05A of 47A	
				DATE STARTED 10.JULY.12 DATE COMPLETED				NEXT 05B	
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. ENG. DEPT.				REV. NO. 00	

	1	2	3	4	5	6	7	8	9	10
A			SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION
			57	-K58C -K580	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (CIRCUIT BREAKER,220), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/34.E6	2	MR	LS	MR-4D(31)+UA-4(40) /MR-4D(31)
			58	-T5B	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/34.F10	1	H3CR	OMRON	H3CR-A8
			59	-K33	AUXILIARY RELAY FOR CONTROL CIRCUIT OF CIRCUIT BREAKER (120), POWER CONSUMPTION 5W, DC 125V,2NO+2NC	/33.F3	1	MR	LS	MR-4D(22)
			60	-K61	CONTACTOR FOR BUSBAR DISCONNECTOR (226A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/24.F7	1	MC	LS	MC-9b+UA-4(31)
B			61	-K62	CONTACTOR FOR BUSBAR DISCONNECTOR (226A) CONTROLLING, OPEN OPERATION DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/24.F8	1	MC	LS	MC-9b+UA-4(31)
			62	-K64C /-K65C /-K66C/-K640	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,226A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/24.F1	4	MR	LS	MR-4D(31)+UA-4(40)
			63	-T64	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/28.E4	1	H3CR	OMRON	H3CR-A8
			64	-K71	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/24.F9	1	MC	LS	MC-9b+UA-4(22)
C			65	-K72	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221A) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/24.F10	1	MC	LS	MC-9b+UA-4(22)
			66	-K81	CONTACTOR FOR BUSBAR DISCONNECTOR (226B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/25.F7	1	MC	LS	MC-9b+UA-4(31)
			67	-K82	CONTACTOR FOR BUSBAR DISCONNECTOR (226B) CONTROLLING, OPEN OPERATION DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/25.F8	1	MC	LS	MC-9b+UA-4(31)
			68	-K84C /-K85C /-K86C/-K840	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR DISCONNECTOR SWITCH,226B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/25.F6	4	MR	LS	MR-4D(31)+UA-4(40)
D			69	-T84	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/28.E8	1	H3CR	OMRON	H3CR-A8
			70	-K91	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/25.F9	1	MC	LS	MC-9b+UA-4(22)
			71	-K92	CONTACTOR FOR MAINTENANCE EARTH SWITCH (221B) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 2NO+2NC AUXILIARY CONTACT, POWER CONSUMPTION 5W	/25.F10	1	MC	LS	MC-9b+UA-4(22)
E			72	-K101	CONTACTOR FOR BUSBAR EARTH SWITCH (261A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/26.F1	1	MC	LS	MC-9b+UA-4(31)
			73	-K102	CONTACTOR FOR BUSBAR EARTH SWITCH (261A) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/26.F2	1	MC	LS	MC-9b+UA-4(31)
			74	-K104C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,261A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.C5	1	MR	LS	MR-4D(31)+UA-4(40)
			75	-K1040	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,261A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.C6	1	MR	LS	MR-4D(31)+UA-4(40)
F			76	-T104	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/26.C5	1	H3CR	OMRON	H3CR-A8
			77	-K111	CONTACTOR FOR BUSBAR EARTH SWITCH (141A) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/26.F6	1	MC	LS	MC-9b+UA-4(31)
			78	-K112	CONTACTOR FOR BUSBAR EARTH SWITCH (141A) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/26.F7	1	MC	LS	MC-9b+UA-4(31)
G	AS-BUILT		BY _____		DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709			
	00	10.JULY.12	FOR APPROVAL		DRAWN BY D.H.HAN CHECKED BY C.Y.HONG		LIST OF APPARATUS, LCC			
	REV. NO.	DATE	DESCRIPTION		DATE STARTED 10.JULY.12 DATE COMPLETED _____		LCC SCHEMATICS FOR D120 BUS SECTION BAY			
					OPRG. DEPT. _____ ENG. DEPT. _____		RIYADH SAUDI ARABIA			
							الشركة الوطنية لنقل الكهرباء			
							National Grid sa			
							CONTRACT NO. 11131113/00			
							INDEX P			
							PLANT NO. C421			
							DRAWING NUMBER CA -323947			
							SHEET NO. 058 of 47A			
							NEXT 05C			
							REV. NO. 00			

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		SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION
A		79	-K114C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,141A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.C6	1	MR	LS	MR-4D(31)+UA-4(40)
		80	-K114D	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,141A), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.C7	1	MR	LS	MR-4D(31)+UA-4(40)
		81	-T114	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/29.C10	1	H3CR	OMRON	H3CR-A8
B		82	-K121	CONTACTOR FOR BUSBAR EARTH SWITCH (261B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/27.F1	1	MC	LS	MC-9b+UA-4(31)
		83	-K122	CONTACTOR FOR BUSBAR EARTH SWITCH (261B) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/27.F2	1	MC	LS	MC-9b+UA-4(31)
		84	-K124C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,261B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.F1	1	MR	LS	MR-4D(31)+UA-4(40)
		85	-K124D /-K1250 /-K1260	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,261B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.F2	3	MR	LS	MR-4D(31)+UA-4(40)
		86	-T124	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/29.F5	1	H3CR	OMRON	H3CR-A8
C		87	-K131	CONTACTOR FOR BUSBAR EARTH SWITCH (141B) CONTROLLING, CLOSE OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/27.F6	1	MC	LS	MC-9b+UA-4(31)
		88	-K132	CONTACTOR FOR BUSBAR EARTH SWITCH (141B) CONTROLLING, OPEN OPERATION, DC 125V, 4NO+1NC CONTACT WITH 3NO+1NC AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/27.F7	1	MC	LS	MC-9b+UA-4(31)
		89	-K134C	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,141B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.F6	1	MR	LS	MR-4D(31)+UA-4(40)
		90	-K134D	AUXILIARY RELAY FOR MULTIPLING AUXILIARY CONTACT OF EQUIPMENT (BUSBAR EARTH SWITCH,141B), 3NO+1NC CONTACT WITH 4NO AUXILIARY CONTACT, POWER CONSUMPTION 5W.	/29.F7	1	MR	LS	MR-4D(31)+UA-4(40)
D		91	-T134	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 5 sec)(A MODE)	/29.F10	1	H3CR	OMRON	H3CR-A8
		92	-DS5	DOOR LIMIT SWITCH FOR LCC ILLUMINATION, 250V, 15A, 1NO+1NC	/13.E3	1	YSR	YONG SUNG	YSR1215GW-B
		93	-DS6	DOOR LIMIT SWITCH FOR LCC ILLUMINATION, 250V, 15A, 1NO+1NC	/13.E4	1	YSR	YONG SUNG	YSR1215GW-B
		94	-S40	OFF/LOCAL/BCU/REMOTE SELECTOR SWITCH, R-TYPE, MANUAL-RETURN	/16.B8	1	A14 RK4257	KRAUS&NAIMER	—
		95	-S50	OFF/LOCAL/BCU/REMOTE SELECTOR SWITCH, R-TYPE, MANUAL-RETURN	/16.B9	1	A14 RK4257	KRAUS&NAIMER	—
		96	-S41	PUSH BUTTON SWITCH FOR LAMP TEST, 1NO+1NC	/16.E3	1	KGF	KG AUTO	KGFH-CM1BK
		97	-S42	PUSH BUTTON SWITCH FOR LONG RUN ALARM STOP OF SPRING CHARGING MOTOR, 1NO+1NC	/20.F6	1	KGF	KG AUTO	KGFH-CM1R
		98	-S43	CHANGEOVER SWITCH FOR LOCK-USE OF CB MOTOR, KNOB-TYPE, MANUAL-RETURN	/20.F7	1	CHR10	KRAUS&NAIMER	RK 6754
E		99							
		100							
		101							
		102							
		103							
		104							
F		105							
		106							
		107							
		108							

AS-BUILT		BY _____	DATE _____	SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء National Grid sa		SHEET NO. 050 of 47A
		DRAWN BY D.H.HAN CHECKED BY C.Y.HONG		LIST OF APPARATUS, LCC						NEXT 06
		DATE STARTED 10.JULY.12 DATE COMPLETED _____		LCC SCHEMATICS FOR D120 BUS SECTION BAY		CONTRACT NO. 11131113/00		INDEX P		PLANT NO. C421
		OPRG. DEPT. _____ ENG. DEPT. _____		RIYADH SAUDI ARABIA		DRAWING NUMBER CA -323947				REV. NO. 00

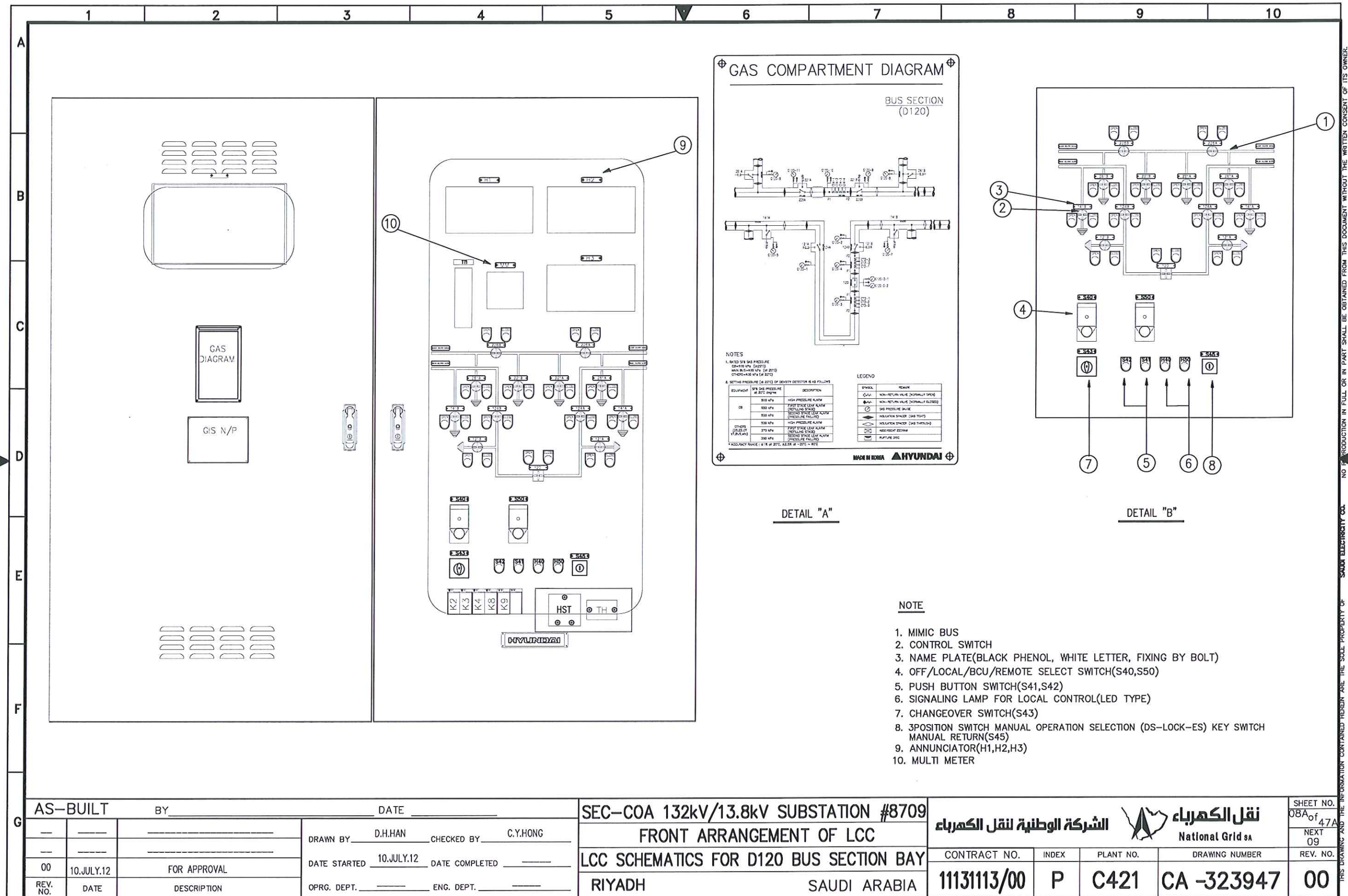
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	SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION		
A	109									
	110									
	111									
	112	-33T/-34T	ON DELAY TIMER, DC 125V, 3 TO 30 MIN. 2NO+2NC (SETTING TIME : 1 min)(A MODE)	/20.F8,33.E4	1		OMRON	H3CR-A8		
	113	-X0,-X1	TERMINAL BLOCKS FOR AC POWER SUPPLY	13, 17	-	URTK/S	PHOENIX	0311087		
	114	-X2,-X3	TERMINAL BLOCKS FOR DC POWER SUPPLY	14, 15	-	URTK/S	PHOENIX	0311087		
	115	-X4	TERMINAL BLOCKS FOR LOCAL INDICATIONS	16, 17	-	USST4	PHOENIX	3070338		
	116	-X5,-X6,-X8A,-X7	TERMINAL BLOCKS FOR BUSBAR DISCONNECTOR WITH MAINTENANCE EARTH SWITCH (124A/121A)	19 TO 38	-	USST4	PHOENIX	3070338		
	117	-X8,-X9,-X9A,-X10	TERMINAL BLOCKS FOR BUSBAR DISCONNECTOR WITH MAINTENANCE EARTH SWITCH (124B/121B)	19 TO 38	-	USST4	PHOENIX	3070338		
	118	-X11,-X12,-X12A	TERMINAL BLOCKS FOR CIRCUIT BREAKER (220)	19 TO 38	-	USST4	PHOENIX	3070338		
	119	-X13,-X14,-X14A,-X15	TERMINAL BLOCKS FOR BUSBAR DISCONNECTOR WITH MAINTENANCE EARTH SWITCH (226A/221A)	19 TO 38	-	USST4	PHOENIX	3070338		
	220	-X16,-X17,-X17A,-X18	TERMINAL BLOCKS FOR BUSBAR DISCONNECTOR WITH MAINTENANCE EARTH SWITCH (226B/221B)	19 TO 38	-	USST4	PHOENIX	3070338		
B	121	-X21, -X22,-X22A	TERMINAL BLOCKS WITH KNIFE TYPE TERMINALS FOR ANNUNCIATOR INPUT SIGNALS ANNUNCIATOR SIDE	39 TO 41	-	UT4-MT	PHOENIX	3046139		
	122	-X23	TERMINAL BLOCKS WITH KNIFE TYPE TERMINAL	30 TO 32	-	UT4-MT	PHOENIX	3046139		
	123	-X24	TERMINAL BLOCKS WITH KNIFE TYPE TERMINALS FOR ANNUNCIATOR GROUPPED OUTPUT SIGNALS	42 TO 43	-	UT4-MT	PHOENIX	3046139		
	124	-X25,-X26,-X26A	TERMINAL BLOCKS FOR BUSBAR EARTH SWITCH (261A)	20 TO 38	-	USST4	PHOENIX	3070338		
	125	-X27,-X28,-X28A	TERMINAL BLOCKS FOR BUSBAR EARTH SWITCH (141A)	20 TO 38	-	USST4	PHOENIX	3070338		
	126	-X29,-X30,-X30A	TERMINAL BLOCKS FOR BUSBAR EARTH SWITCH (261B)	20 TO 38	-	USST4	PHOENIX	3070338		
	127	-X31,-X32,-X32A	TERMINAL BLOCKS FOR BUSBAR EARTH SWITCH (141B)	20 TO 38	-	USST4	PHOENIX	3070338		
C	128	-X34A	BOLT CONNECTING & DISCONNECTING TERMINAL BLOCK FOR CT IN LCC.	47 TO 49	-	OTTA6-T-P/P	PHOENIX	0790462		
	129	-X34B	BOLT CONNECTING TERMINAL BLOCK FOR CT IN LCC.	47 TO 49	-	OTTA6	PHOENIX	0790433		
	130	OUTLET	220V, 15A	/13.C10	1	-	LEGRAND	-		
	131	-K201,-K202, -K203,-K204	AUXILIARY RELAY FOR DS & ES OPERATION INTERLOCK, POWER CONSUMPTION 5W, DC 125V, 4NC.	/18.D1	4	MR	LS	MR-4D(04)+UA-4(31)		
	132	-TEL	DEK301-6C. TELEPHONE JACK.	/13.C9	1	DEK301-6C	DAE-EUN	DEK301-6C		
	133	-XT	TERMINAL BLOCKS FOR TELEPHONE JACK	/13.C9	1	USST4	PHOENIX	3070338		
	134									
D	135	TH	THERMOSTAT -10~50DEG.C	/13.E5	1	PLS-050A		-		
	136	HT	AL-MOLD HEATER, 5000HM, MAX 200W	/13.D5	1	RSHT-200	RARA	-		
	137	HST	HUMIDISTAT FOR PANEL HUMIDITY CONTROL, 30~80%, RH	/13.D6	1	H615A	HONEY WELL	-		
	138	-K1M	CONTACTOR FOR BUSBAR DISCONNECTOR WITH MAINTENANCE ES(124A/121A) MOTOR OPERATION, DC 125V, 3NO+1NC CONTACT, POWER CONSUMPTION 3W	/19.E2	1	GMD	LS	GMD-9M		
	139	-K2M	CONTACTOR FOR BUSBAR DISCONNECTOR WITH MAINTENANCE ES(124B/121B) MOTOR OPERATION, DC 125V, 3NO+1NC CONTACT, POWER CONSUMPTION 3W	/19.E4	1	GMD	LS	GMD-9M		
	140	-K3M	CONTACTOR FOR BUSBAR DISCONNECTOR WITH MAINTENANCE ES(226A/221A) MOTOR OPERATION, DC 125V, 3NO+1NC CONTACT, POWER CONSUMPTION 3W	/19.E6	1	GMD	LS	GMD-9M		
	141	-K4M	CONTACTOR FOR BUSBAR DISCONNECTOR WITH MAINTENANCE ES(226B/221B) MOTOR OPERATION, DC 125V, 3NO+1NC CONTACT, POWER CONSUMPTION 3W	/19.E8	1	GMD	LS	GMD-9M		
E	142	-R2,R3,R4,R5 -R6,R7,R8,R9	RESISTORS FOR MOTOR OPERATION MECHANISM, 100Kohm	/19.20	8	IRH	RARA	IRH-100		
	143	-S45	3POSITION SWITCH MANUAL OPERATION SELECTION (DS-LOCK-ES) KEY SWITCH MANUAL RETURN	/21.F2	1	CH16	KRAUS&NAMER	RK-8350		
	144	-T1,-T2	ON DELAY TIMER, DC 125V, 2NO+2NC, 1 TO 10 sec. (SETTING TIME : 5sec)(A MODE)	/18.D9	2	H3CR	OMRON	H3CR-A8		
	145	-K37A	AUXILIARY RELAY FOR SYNCHRO CHECK. POWER CONSUMPTION 9W, DC 125V, 2NO+2NC.	/34.E3	1	GMR	LS	MR-4D		
	146	-MM	MULTI-FUNCTION METER VOLTAGE AC 85~265V, DC 100~300V, 50/60Hz, INPUT 0~347V, 1~10A	/47.E3	1	ION	SCHENIDER	ION 6200		
	147	-T9	ON DELAY TIMER, DC 125V, 2NO+2NC, 1 TO 10 sec. (SETTING TIME:5sec)(B MODE)	/18.D7	1	H3CR	OMRON	H3CR-A		
	148									
	149									

G	AS-BUILT		BY _____	DATE _____	SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO. 06 of 47A
					LIST OF APPARATUS, LCC		National Grid sa				NEXT 06A
					LCC SCHEMATICS FOR D120 BUS SECTION BAY		CONTRACT NO. 11131113/00		INDEX P		REV. NO. 00
					RIYADH SAUDI ARABIA		PLANT NO. C421		DRAWING NUMBER CA -323947		
00		10.JULY.12	FOR APPROVAL		DRAWN BY D.H.HAN CHECKED BY C.Y.HONG						
REV. NO.		DATE	DESCRIPTION		DATE STARTED 10.JULY.12 DATE COMPLETED _____						
					OPRG. DEPT. _____ ENG. DEPT. _____						

	1	2	3	4	5	6	7	8	9	10
A			SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION
			150	-K205,-K206,-K207	AUXILIARY RELAY FOR DS & ES OPERATION INTERLOCK, POWER CONSUMPTION 5W, DC 125V, 4NC.	/18.D1	10	MR	LS	MR-4D(04)
			151	-K37A	AUXILIARY RELAY FOR SYNCHRO CHECK, POWER CONSUMPTION 5W, DC 125V, 2NO+2NC.	/34.E2	1	MR	LS	MR-4D(22)
			152	-K210	AUXILIARY RELAY FOR DS & ES OPERATION INTERLOCK, POWER CONSUMPTION 5W, DC 125V, 4NO.	/18.E7	1	MR	LS	MR-4D(40)
			153	-K220,-K221	AUXILIARY RELAY FOR INTERLOCK BUSBAR DISCONNECTOR, POWER CONSUMPTION 5W, DC 125V, 4NO WITH 4NO AUXILIARY CONTACT.	/29.B2	2	MR	LS	MR-4D(40)+UA-4(40)
			154	-REC.	AC 127V,15A	/13.E4	1		LEGRAND	
			155	-F21	MINIATURE CIRCUIT BREAKER,2NC AUXILIARY CONTACT, DOUBLE POLE 6A FOR BCU DC SUPPLY	/15.C6	1	S202P-K6 +S2C-H6R+S2C-H6R	ABB	2CES 282 001 R0377 + 2CES200912R0001 *2
B			156	-K48	AUXILIARY RELAY FOR SPRING CHARGE MOTOR THERMAL FAULT DC125V, 2NO+2NC CONTACT	/20.F6	1	MR	LS	MR-4D(22)
			157	-L10	SEMAPHORE INDICATOR FOR BUSBAR DISCONNECTOR (124A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F2	1	AD16	APT	AD16-22W/G
			158	-L11	SEMAPHORE INDICATOR FOR MAINTENANCE EARTH SWITCH (121A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F3	1	AD16	APT	AD16-22W/G
			159	-L12	SEMAPHORE INDICATOR FOR BUSBAR DISCONNECTOR (124B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F2	1	AD16	APT	AD16-22W/G
			160	-L13	SEMAPHORE INDICATOR FOR MAINTENANCE EARTH SWITCH (121B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F3	1	AD16	APT	AD16-22W/G
			161	-L14	SEMAPHORE INDICATOR FOR CIRCUIT BREAKER (120) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F2	1	AD16	APT	AD16-22WF/G
C			162	-L15	SEMAPHORE INDICATOR FOR BUSBAR DISCONNECTOR (226A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/16.F2	1	AD16	APT	AD16-22W/G
			163	-L16	SEMAPHORE INDICATOR FOR MAINTENANCE EARTH SWITCH (221A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F2	1	AD16	APT	AD16-22W/G
			164	-L17	SEMAPHORE INDICATOR FOR BUSBAR DISCONNECTOR (226B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F3	1	AD16	APT	AD16-22W/G
			165	-L18	SEMAPHORE INDICATOR FOR MAINTENANCE EARTH SWITCH (221B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F2	1	AD16	APT	AD16-22W/G
			166	-L19	SEMAPHORE INDICATOR FOR BUSBAR EARTH SWITCH (261A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F3	1	AD16	APT	AD16-22W/G
			167	-L20	SEMAPHORE INDICATOR FOR BUSBAR EARTH SWITCH (141A) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F2	1	AD16	APT	AD16-22W/G
D			168	-L21	SEMAPHORE INDICATOR FOR BUSBAR EARTH SWITCH (261B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F2	1	AD16	APT	AD16-22W/G
			169	-L22	SEMAPHORE INDICATOR FOR BUSBAR EARTH SWITCH (141B) WITH LED TYPE, RED(WHEN CLOSE), GREEN(WHEN OPEN)	/17.F2	1	AD16	APT	AD16-22W/G
			170	-S111~S231	PUSH BUTTON SWITCH FOR CB & DS & ES OPEN COMMAND WITH SELF-RETURN, 1NO+1NC	/21,22,24,25,26,27,34	13	KGF	KG AUTO	KGFH-CM1G
			171	-S112~S232	PUSH BUTTON SWITCH FOR CB & DS & ES CLOSE COMMAND WITH SELF-RETURN, 1NO+1NC	/21,22,24,25,26,27,34	13	KGF	KG AUTO	KGFH-CM1R
			172	-BCU	BAY CONTROL UNIT, REC670	/30,31,32,32A	1	REC	ABB	REC670
E			173							
			174							
F										
G	AS-BUILT	BY	DATE	SEC-COA 132kV/13.8kV SUBSTATION #8709						
				LIST OF APPARATUS, LCC						
				LCC SCHEMATICS FOR D120 BUS SECTION BAY						
				RIYADH SAUDI ARABIA						
	00	10.JULY.12	FOR APPROVAL	DRAWN BY D.H.HAN	CHECKED BY C.Y.HONG	الشركة الوطنية لنقل الكهرباء				
				DATE STARTED 10.JULY.12	DATE COMPLETED	National Grid sa				
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT.	ENG. DEPT.	CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
						11131113/00	P	C421	CA -323947	06A of 47A
										NEXT 07
										REV. NO.
										00

1	2	3	4	5	6	7	8	9	10
SER.NO.	DESIGNATION	DESCRIPTION	SHT.NO	QTY	TYPE	MAKER	ORDERING INFORMATION		
< FOR GCB MOTOR SPRING OPERATING MECHANISM >									
1	-Y1	CLOSING COIL OF CIRCUIT BREAKER, 14 p DC 125V	/33	1	-	HYUNDAI	-		
2	-Y2	TRIPPING COIL 1 OF CIRCUIT BREAKER, 12 p DC 125V	/33	1	-	HYUNDAI	-		
3	-Y3	TRIPPING COIL 2 OF CIRCUIT BREAKER, 12 p DC 125V	/33	1	-	HYUNDAI	-		
4	-M4	DC MOTOR FOR SPRING CHARGING, DC 125V, 10A, 8000rpm, I=7.9A	/20	1	-	DONG JIN	-		
5	-S1	AUXILIARY CONTACT FOR CIRCUIT BREAKER, 9NO+8NC	/36	1	-	YONG SUNG	-		
6	-S2	AUXILIARY CONTACT FOR CIRCUIT BREAKER, 9NO+8NC	/36	1	-	YONG SUNG	-		
7	-S34	GAS PRESSURE METER FOR CB, 500 kPa FOR TRIP2	/33	1	233.52.100	WIKA	233.52.100+820.1.1.2		
8	-S35	GAS PRESSURE METER FOR CB, LOW PRESSURE 550 kPa, CLOSE BLOCK 5.0 barTRIP1	/33,34	1	233.52.100	WIKA	233.52.100+820.1.1.2		
9	HT	AL-MOLD HEATER, 500ohm, MAX 200W	/13	1	-	HYUNDAI	-		
< FOR MOTOR OPERATING MECHANISM OF 3POSITION SWITCH >									
1	-M2	DC MOTOR, DC125V, 100W, 2A, 3600±10% RPM	/19	1	-	DMK	-		
2	-LSA	LIMIT SWITCH(ON: WHEN DS/ES IS OPEN), DC125V, 1NO+1NC.	/21,22,24,25	1	-	HK-10	-		
3	-LSB	LIMIT SWITCH(ON: WHEN DS/ES IS CLOSED), DC125V, 1NO+1NC.	/21,22,24,25	1	-	HK-10	-		
4	-DS1	DOOR S/W(ON: WHEN OPENING OF BOX COVER), DC125V, 10A.	/21,22,24,25	1	-	HK-10	-		
5	-DS2	DOOR S/W(ON: WHEN OPENING OF BOX COVER), DC125V, 10A.	/21,22,24,25	1	-	HK-10	-		
6	-DS3	DOOR S/W(ON: WHEN OPENING OF BOX COVER), DC125V, 10A.	/21,22,24,25	1	-	HK-10	-		
7	-ILMD	INTERLOCK MAGNET, DC 125V, 7W 698ohm	/21,22,24,25	1	3CF5265-001	MOTION TECH.	-		
8	-ILME	INTERLOCK MAGNET, DC 125V, 7W 698ohm	/21,22,24,25	1	3CF5265-001	MOTION TECH.	-		
9	-PS1	PADLOCK KEY SWITCH, 125V, 10A	/21,22,24,25	1	KH-302K	KUN HEUNG	KH-302K-2105		
10	HT	HEATER, 2kohm, MAX 60W	/13	1	-	SAM WHA	-		
< FOR MOTOR OPERATION MECHANISM OF 261A/261B/141A/141B >									
1	-M2	DC GEARED MOTOR, DC 125V, 50W, 5.0A 138 RPM WITH DAMPING RESISTOR-RM(RWH 60 HOS, 100ohm)	/20	1	DM-51023	DONG JIN	-		
2	-LSA	LIMIT SWITCH(ON: WHEN DS/ES IS OPEN), DC125V, 1NO+1NC.	/26,27	1	-	HK-10	-		
3	-LSB	LIMIT SWITCH(ON: WHEN DS/ES IS CLOSED), DC125V, 1NO+1NC.	/26,27	1	-	HK-10	-		
4	-DS1	DOOR S/W(ON: WHEN OPENING OF BOX COVER), DC125V, 10A.	/26,27	1	-	HK-10	-		
5	-DS2	DOOR S/W(ON: WHEN OPENING OF BOX COVER), DC125V, 10A.	/26,27	1	-	HK-10	-		
6	-ILM	INTERLOCK MAGNET, DC 125V, 6.4W, 1750ohm WITH RESISTOR-R2(RWH 20HOS, DC125V, 700ohm)	/26,27	1	-	DAE YOUNG	-		
7	-S1	AUXILIARY CONTACT, 6NO(1EARLY MAKE+5LATE MAKE)+6NC(1LATE BREAK+5EARLY BREAK)	/35,36	1	-	DAE YOUNG	-		
8	-S2	AUXILIARY CONTACT, 6NO(1EARLY MAKE+5LATE MAKE)+6NC(1LATE BREAK+5EARLY BREAK)	/35,36	1	-	DAE YOUNG	-		
	-PS1	PADLOCK KEY SWITCH, 125V, 10A	/26,27	-	KH-302K	KUN HEUNG	KH-302K-2105		
	HT	HEATER, 2kohm, MAX 60W	/13	1	RWH 60 HOS	SAM WHA	-		
< FOR GENERAL GAS COMPARTMENTS, EXCEPT CIRCUIT BREAKER >									
1	-S71	GAS PRESSURE METER FOR GAS COMP. G120-1, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.B6	1	233.52.100	WIKA	233.52.100+820.2.2.1		
2	-S72	GAS PRESSURE METER FOR GAS COMP. G120-2, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.B7	1	233.52.100	WIKA	233.52.100+820.2.2.1		
3	-S73	GAS PRESSURE METER FOR GAS COMP. G120-3, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.B8	1	233.52.100	WIKA	233.52.100+820.2.2.1		
4	-S74	GAS PRESSURE METER FOR GAS COMP. G120-4, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.B9	1	233.52.100	WIKA	233.52.100+820.2.2.1		
5	-S75	GAS PRESSURE METER FOR GAS COMP. G120-5, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.B10	1	233.52.100	WIKA	233.52.100+820.2.2.1		
6	-S76	GAS PRESSURE METER FOR GAS COMP. G120-6, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.D6	1	233.52.100	WIKA	233.52.100+820.2.2.1		
7	-S77	GAS PRESSURE METER FOR GAS COMP. G120-7, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.D7	1	233.52.100	WIKA	233.52.100+820.2.2.1		
8	-S78	GAS PRESSURE METER FOR GAS COMP. G120-8, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.D8	1	233.52.100	WIKA	233.52.100+820.2.2.1		
9	-S79	GAS PRESSURE METER FOR GAS COMP. G120-9, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.D9	1	233.52.100	WIKA	233.52.100+820.2.2.1		
10	-S80	GAS PRESSURE METER FOR GAS COMP. G120-10, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.D10	1	233.52.100	WIKA	233.52.100+820.2.2.1		
11	-S81	GAS PRESSURE METER FOR GAS COMP. G120-11, LOW PRESSURE 350&370 kPa HIGH DENSITY 500 kPa	/38.E6	1	233.52.100	WIKA	233.52.100+820.2.2.1		
< FOR CT SECONDARY TERMINAL BOX >									
1	-X50	EPOXY INSULATED GAS SEALING TERMINALS (16 POLES)	/47	1		HYUNDAI			
2	-X51	EPOXY INSULATED GAS SEALING TERMINALS (16 POLES)	/47	1		HYUNDAI			
3	-X52	EPOXY INSULATED GAS SEALING TERMINALS (16 POLES)	/47	1		HYUNDAI			

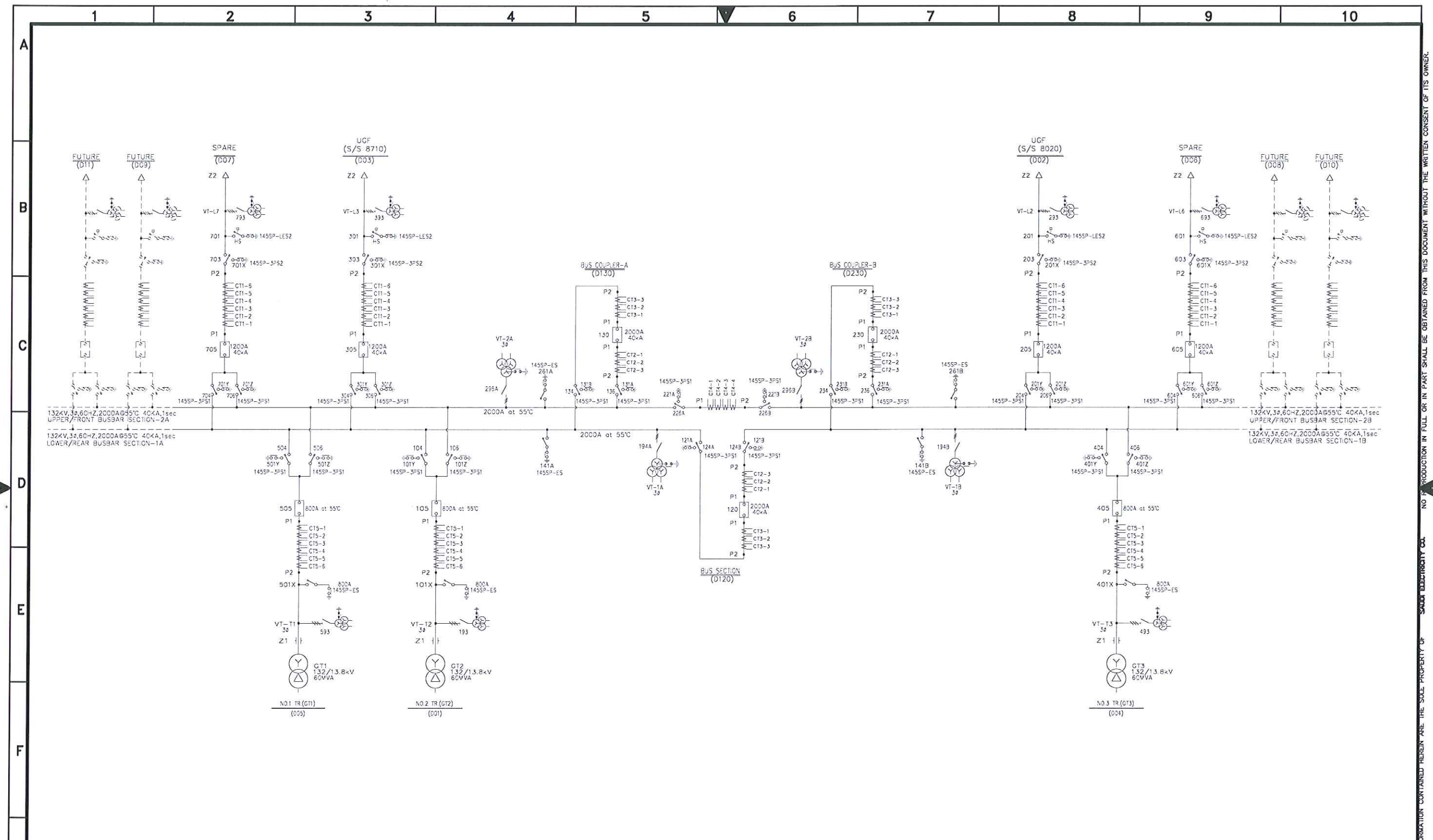
AS-BUILT		BY _____ DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO. 07 of 47A	
		DRAWN BY D.H.HAN CHECKED BY C.Y.HONG		LIST OF APPARATUS, MECHANISM		National Grid sa		National Grid sa		NEXT 08	
		DATE STARTED 10.JULY.12 DATE COMPLETED _____		LCC SCHEMATICS FOR D120 BUS SECTION BAY		CONTRACT NO. 11131113/00		INDEX P		REV. NO. 00	
REV. NO.		DATE		DESCRIPTION		PLANT NO. C421		DRAWING NUMBER CA -323947		00	



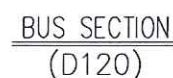
AS-BUILT		BY _____	DATE _____
00	10.JULY.12	FOR APPROVAL	DRAWN BY D.H.HAN CHECKED BY C.Y.HONG
REV. NO.	DATE	DESCRIPTION	DATE STARTED 10.JULY.12 DATE COMPLETED _____
			OPRG. DEPT. _____ ENG. DEPT. _____

SEC-COA 132kV/13.8kV SUBSTATION #8709	
FRONT ARRANGEMENT OF LCC	
LCC SCHEMATICS FOR D120 BUS SECTION BAY	
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa		SHEET NO. 08A of 47A
CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
11131113/00	P	C421	CA -323947	00



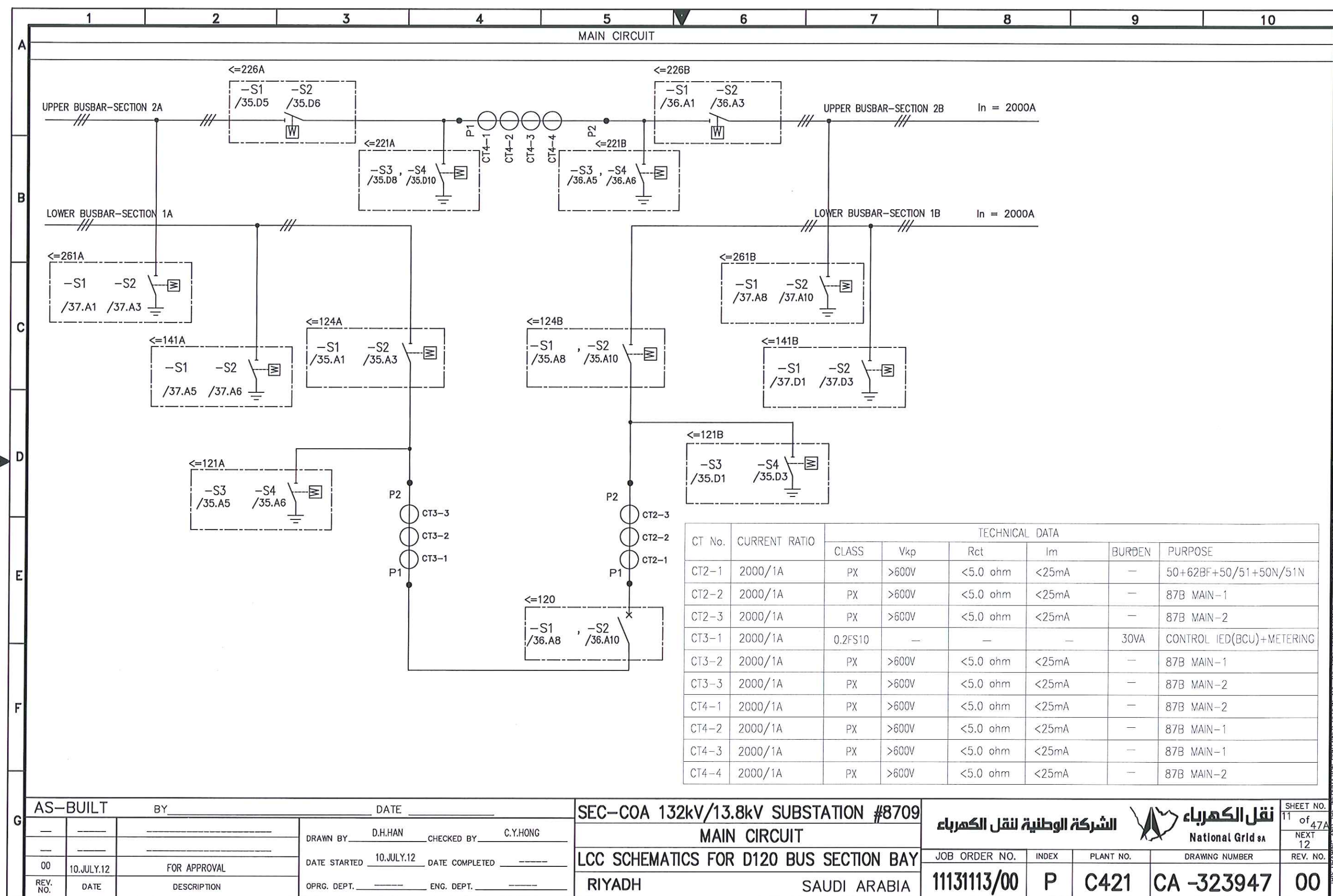
AS-BUILT			BY		DATE		SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.	
							OPERATION ONE LINE DIAGRAM				National Grid sa		09 of 47A	
			DRAWN BY		D.H.HAN		CHECKED BY		H.J.PANG				NEXT	
			DATE STARTED		10.JULY.12		DATE COMPLETED						10	
			OPRG. DEPT.				ENG. DEPT.						REV. NO.	
													00	



* REMARK	
O : OPEN STATE	
C : CLOSED STATE	
- : INDEPENDENT CONDITION	FO : FULLY OPEN
C+S : CONTROL AND SIGNALLING	FC : FULLY CLOSE
S : SIGNALLING ONLY	

5. BUS VT's MCB ON
6. CB GAS PRESSURE > CB GAS PRESSURE LOW STAGE 1
7. CB GAS PRESSURE > CB GAS PRESSURE LOW STAGE 2

الشركة الوطنية لنقل الكهرباء		 نقل الكهرباء National Grid sa		SHEET NO 10 of 47 NEXT 11 REV. NO
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	
11131113/00	P	C421	CA -323947	00



AS-BUILT		BY _____	DATE _____
00	10.JULY.12	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	

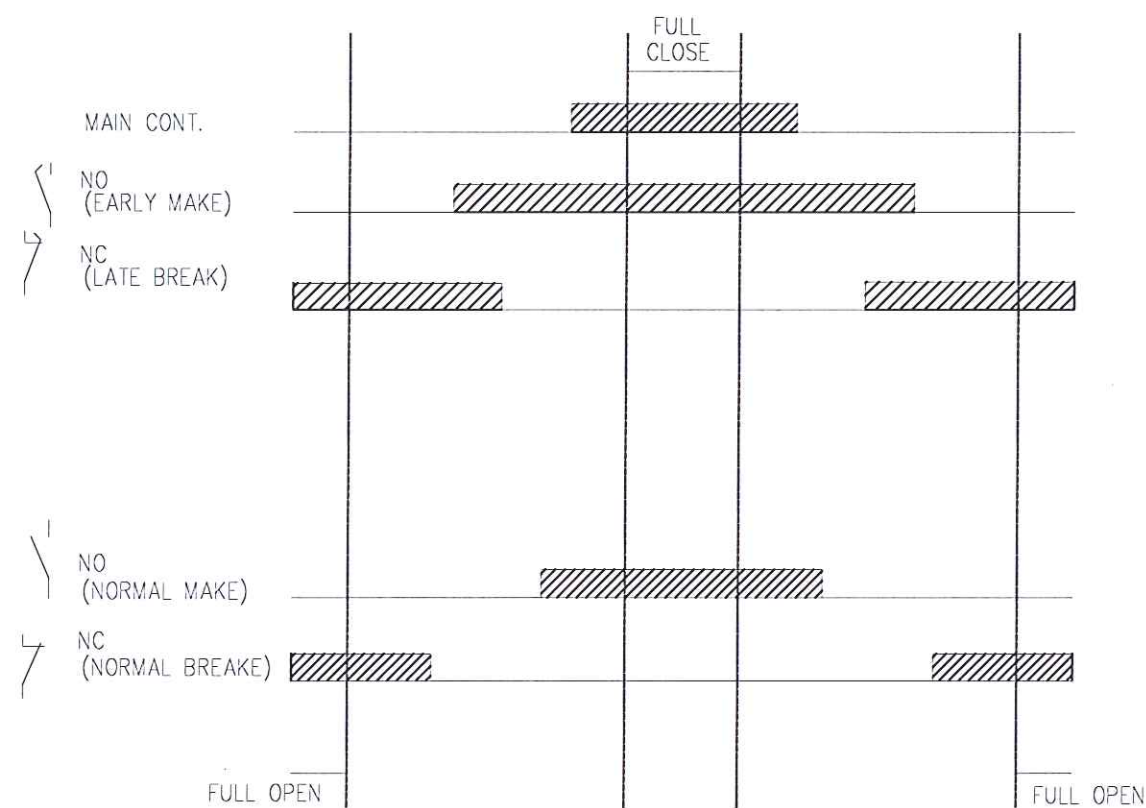
DRAWN BY	D.H.HAN	CHECKED BY	C.Y.HONG
DATE STARTED	10.JULY.12	DATE COMPLETED	_____
OPRG. DEPT.	_____	ENG. DEPT.	_____

SEC-COA 132kV/13.8kV SUBSTATION #8709
MAIN CIRCUIT
 LCC SCHEMATICS FOR D120 BUS SECTION BAY
 RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa		SHEET NO. 11 of 47A
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
11131113/00	P	C421	CA -323947	00

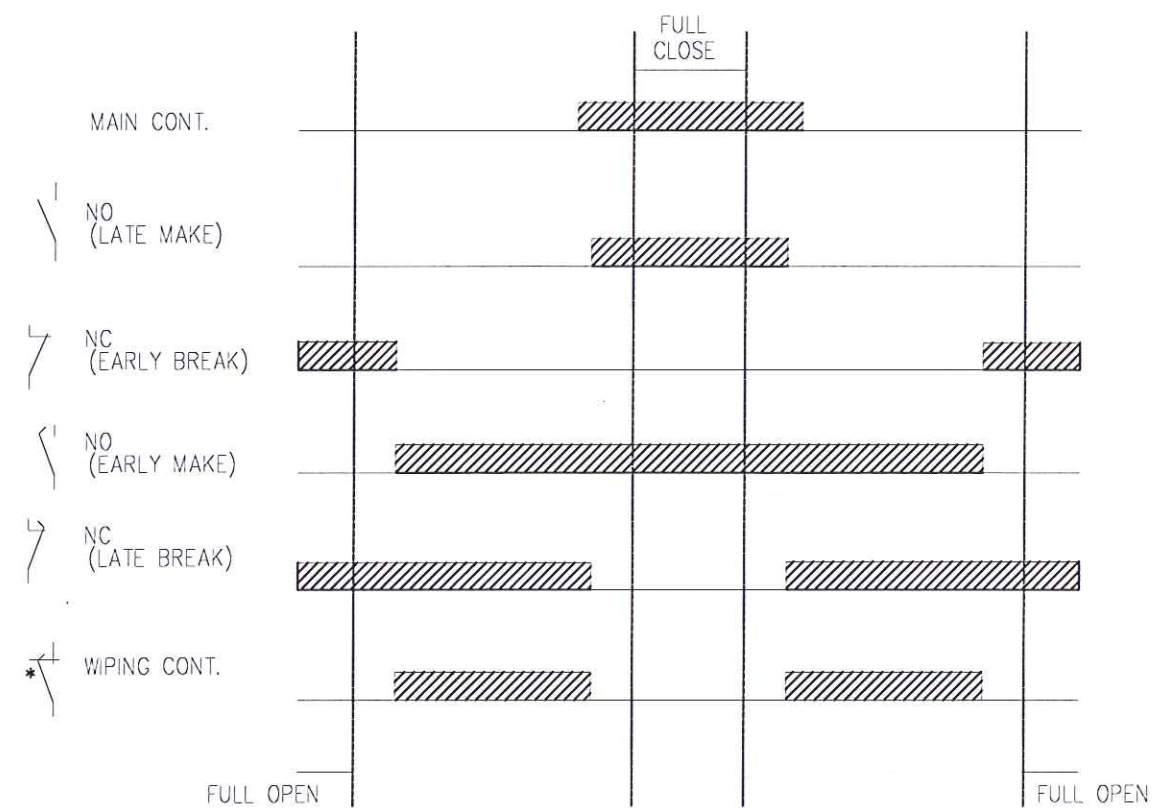
1. SWITCHING DIAGRAM FOR CIRCUIT BREAKER

▨ : CONTACT CLOSED



2. SWITCHING DIAGRAM FOR DS & ES

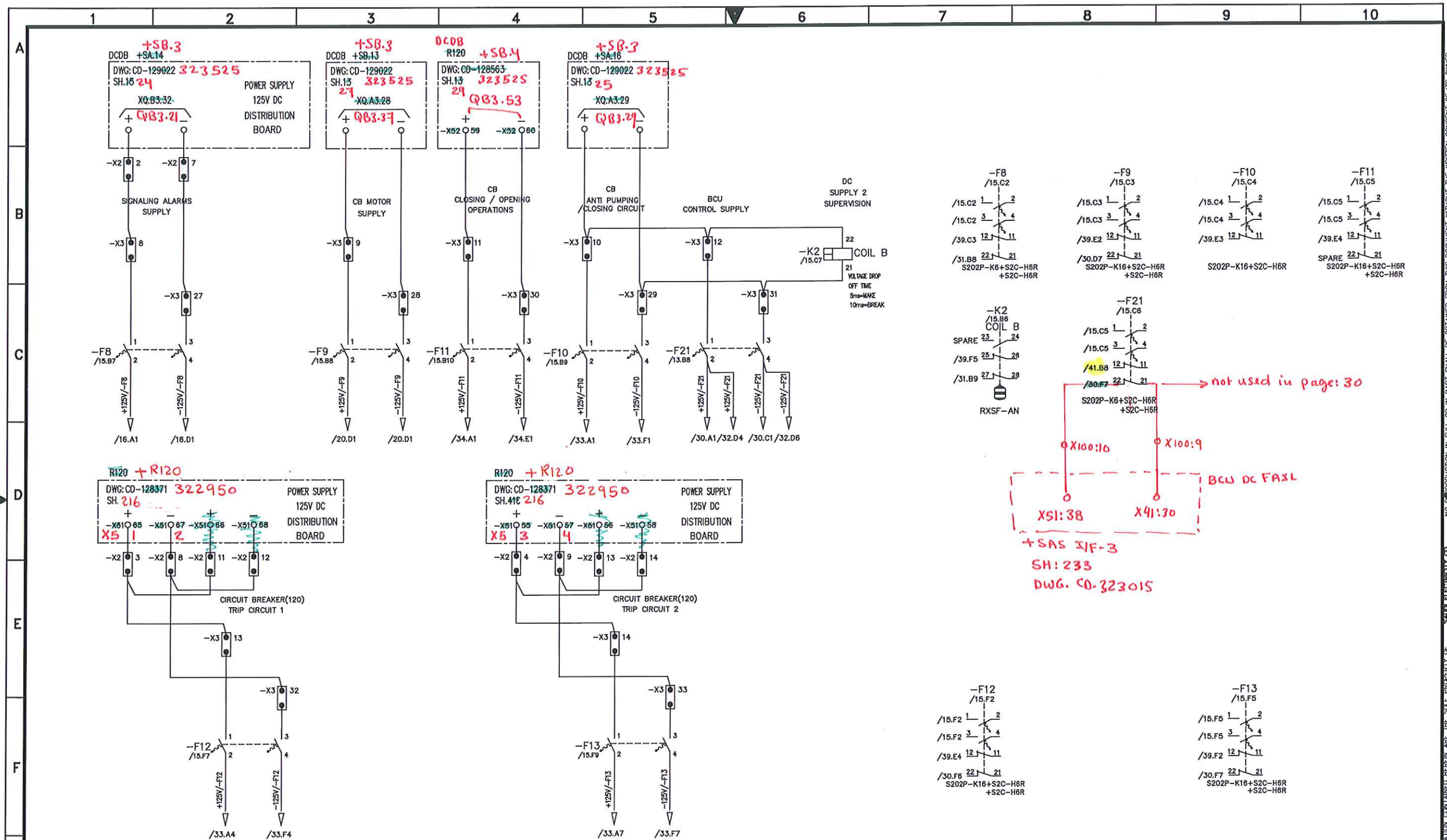
▨ : CONTACT CLOSED



AS-BUILT		BY	DATE
00	10.JULY.12	FOR APPROVAL	10.JULY.12
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. ENG. DEPT.

SEC-COA 132kV/13.8kV SUBSTATION #8709	
SWITCHING DIAGRAM	
LCC SCHEMATICS FOR D120 BUS SECTION BAY	
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
National Grid sa		SHEET NO. 12 of 47A	
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER
11131113/00	P	C421	CA -323947
REV. NO. 00		NEXT 13	

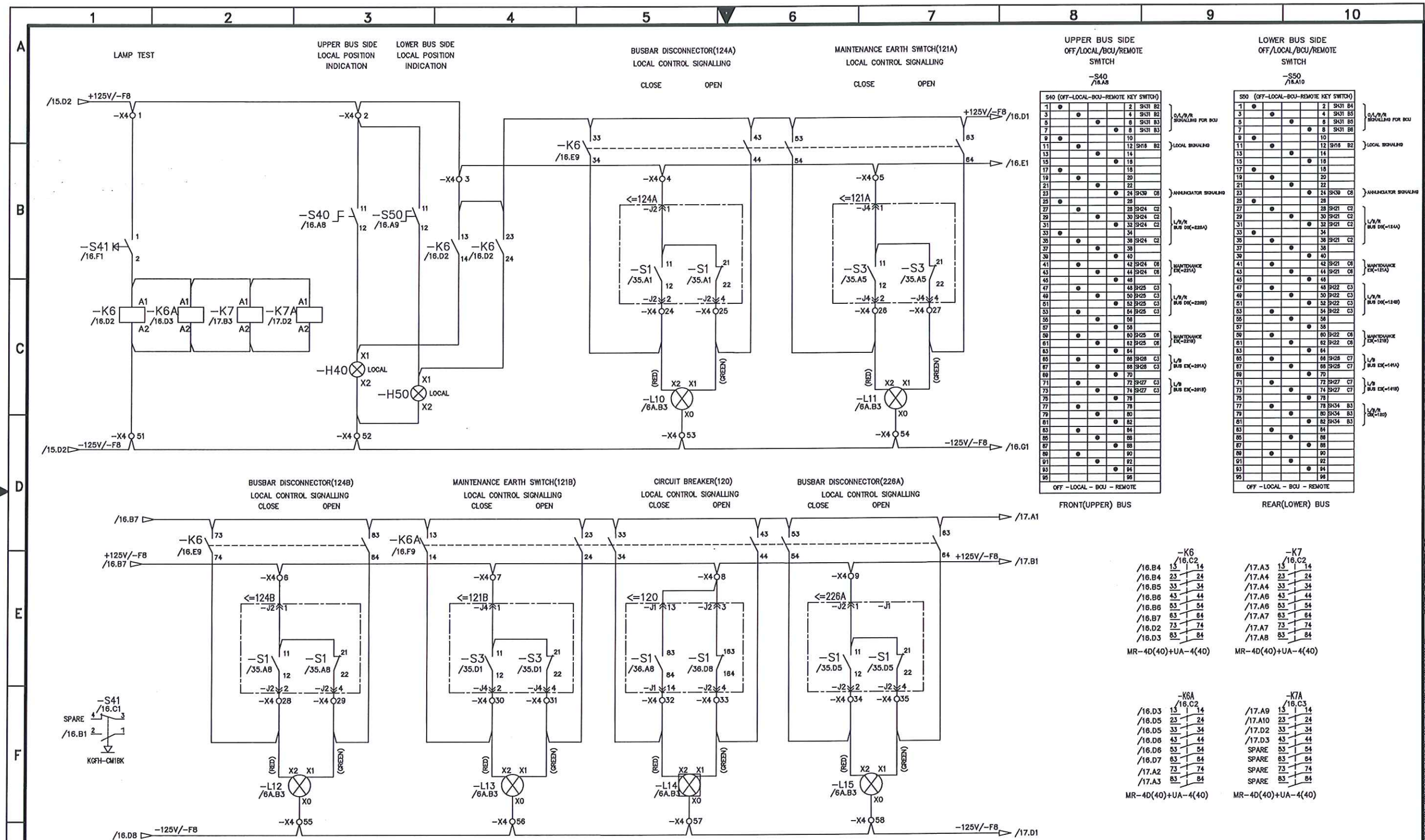


AS-BUILT		BY	DATE
00	10.JULY.12	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	

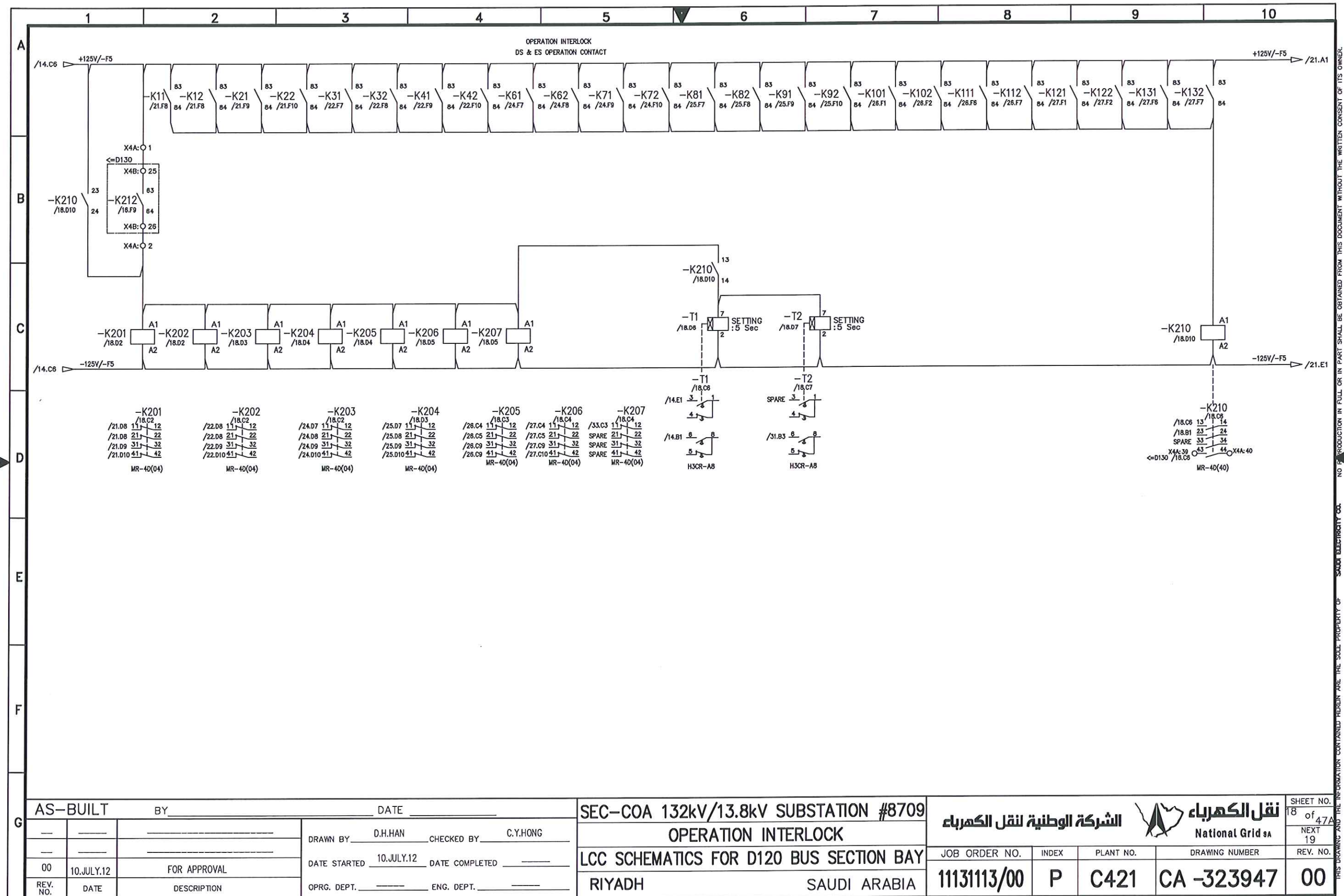
DRAWN BY: D.H.HAN CHECKED BY: C.Y.HONG
 DATE STARTED: 10.JULY.12 DATE COMPLETED: _____
 OPRG. DEPT.: _____ ENG. DEPT.: _____

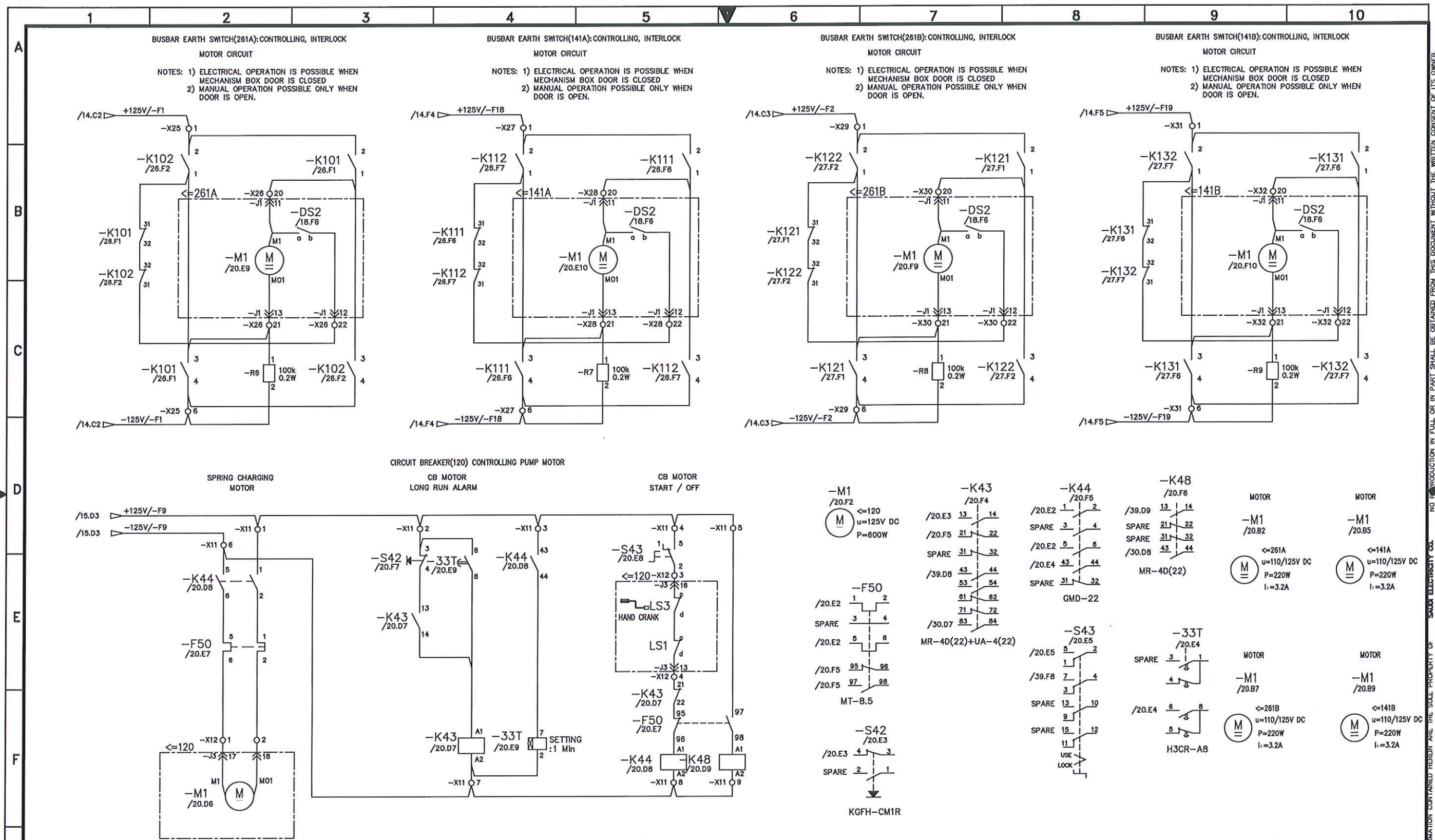
SEC-COA 132kV/13.8kV SUBSTATION #8709
 DC POWER SUPPLY (TRIP COIL 1,2)
 LCC SCHEMATICS FOR D120 BUS SECTION BAY
 RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid	
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
11131113/00	P	C421	CA -323947	15 of 47A	00



AS-BUILT		BY	DATE	SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO. 16 of 47A	
				LOCAL POSITION INDICATOR 1				National Grid SA		NEXT 17	
				LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO. 11131113/00		REV. NO. 00	
				RIYADH SAUDI ARABIA				INDEX P		DRAWING NUMBER CA-323947	
								PLANT NO. C421			



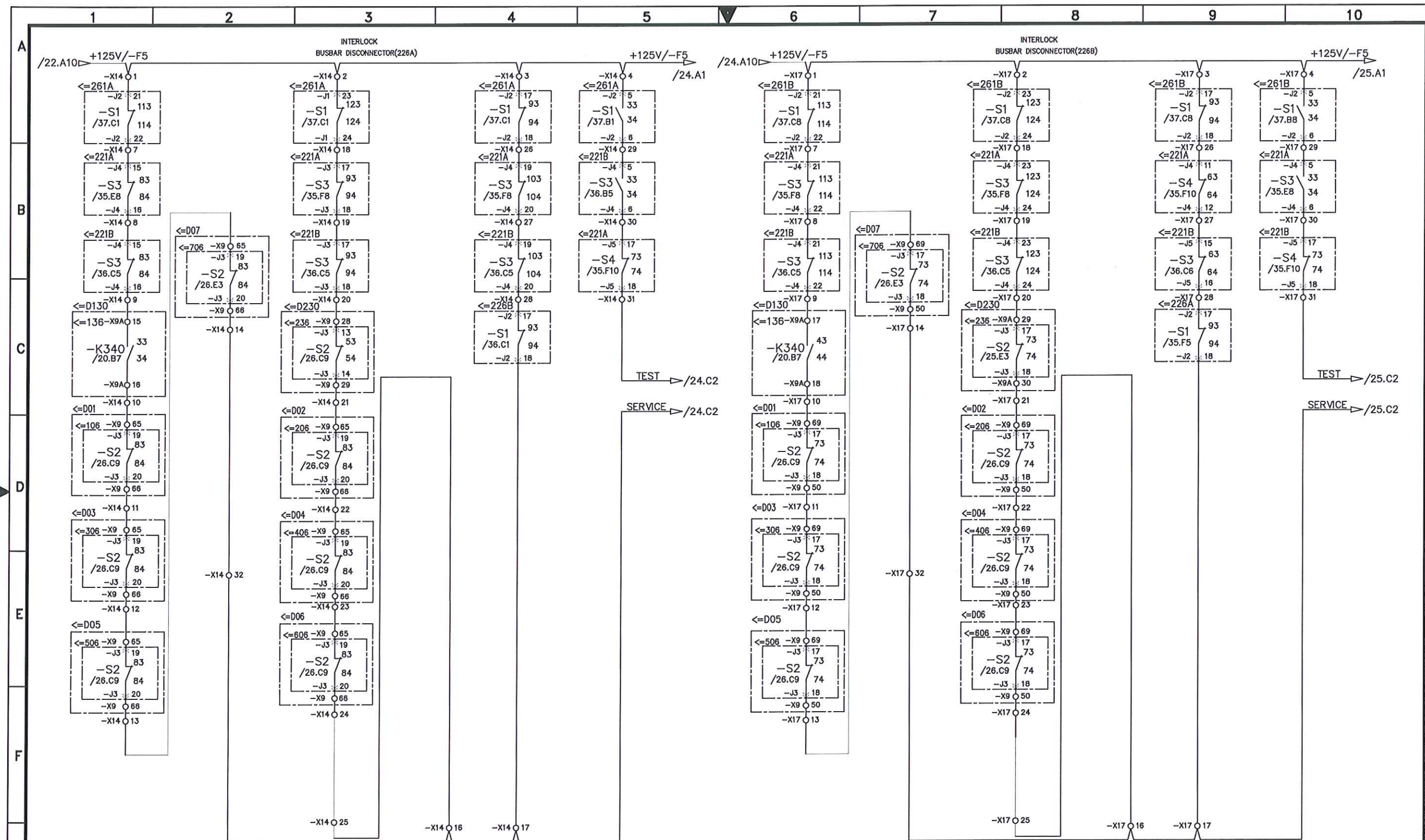


AS-BUILT		BY	DATE
00	10.JULY.12	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	

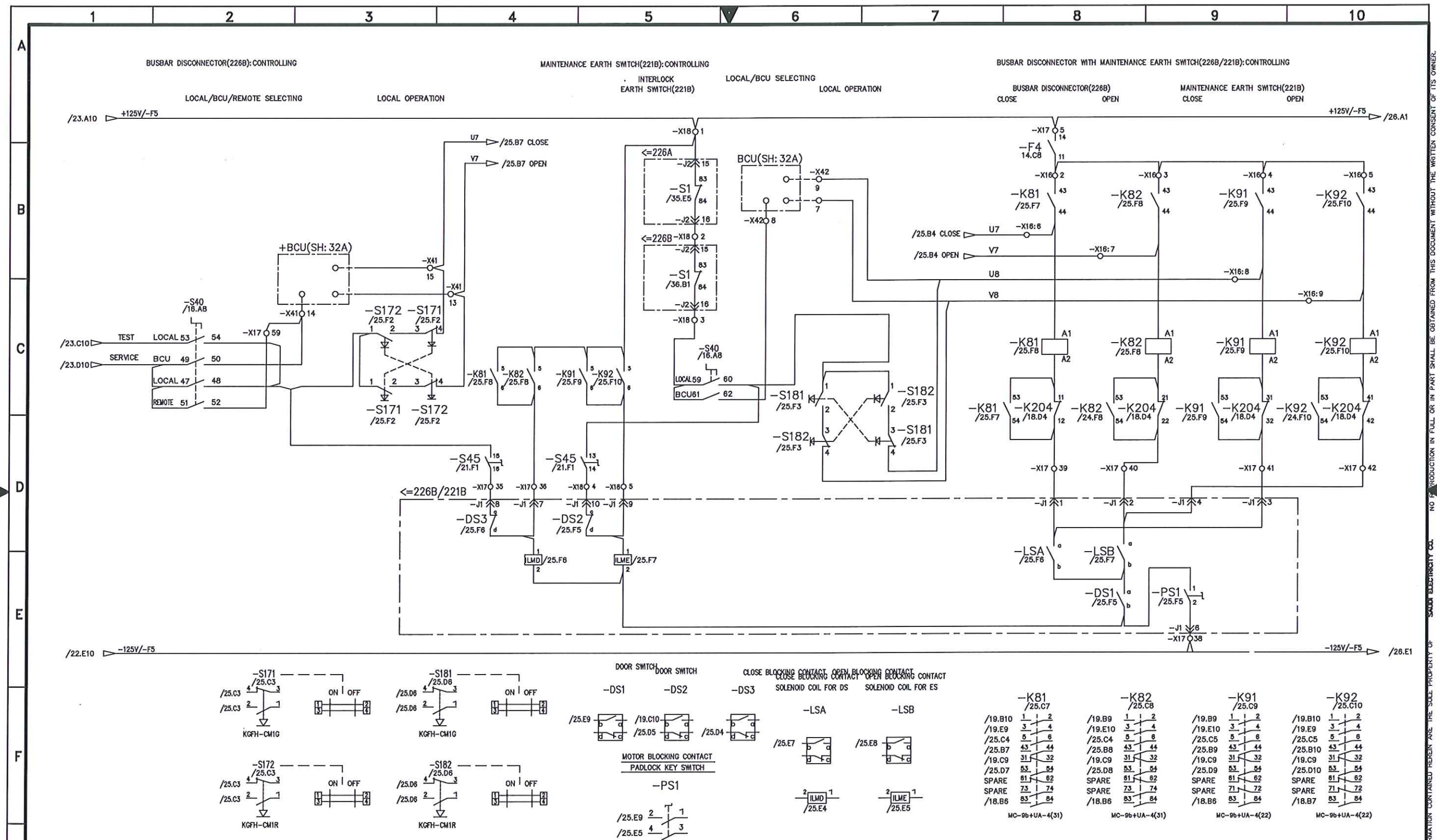
DRAWN BY	D.H.HAN	CHECKED BY	C.Y.HONG
DATE STARTED	10.JULY.12	DATE COMPLETED	
OPRG. DEPT.		ENG. DEPT.	

SEC-COA 132kV/13.8kV SUBSTATION #8709
 MOTOR DRIVE CIRCUIT 2
 LCC SCHEMATICS FOR D120 BUS SECTION BAY
 RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.
		National Grid sa		20 of 47A
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
11131113/00	P	C421	CA-323947	00



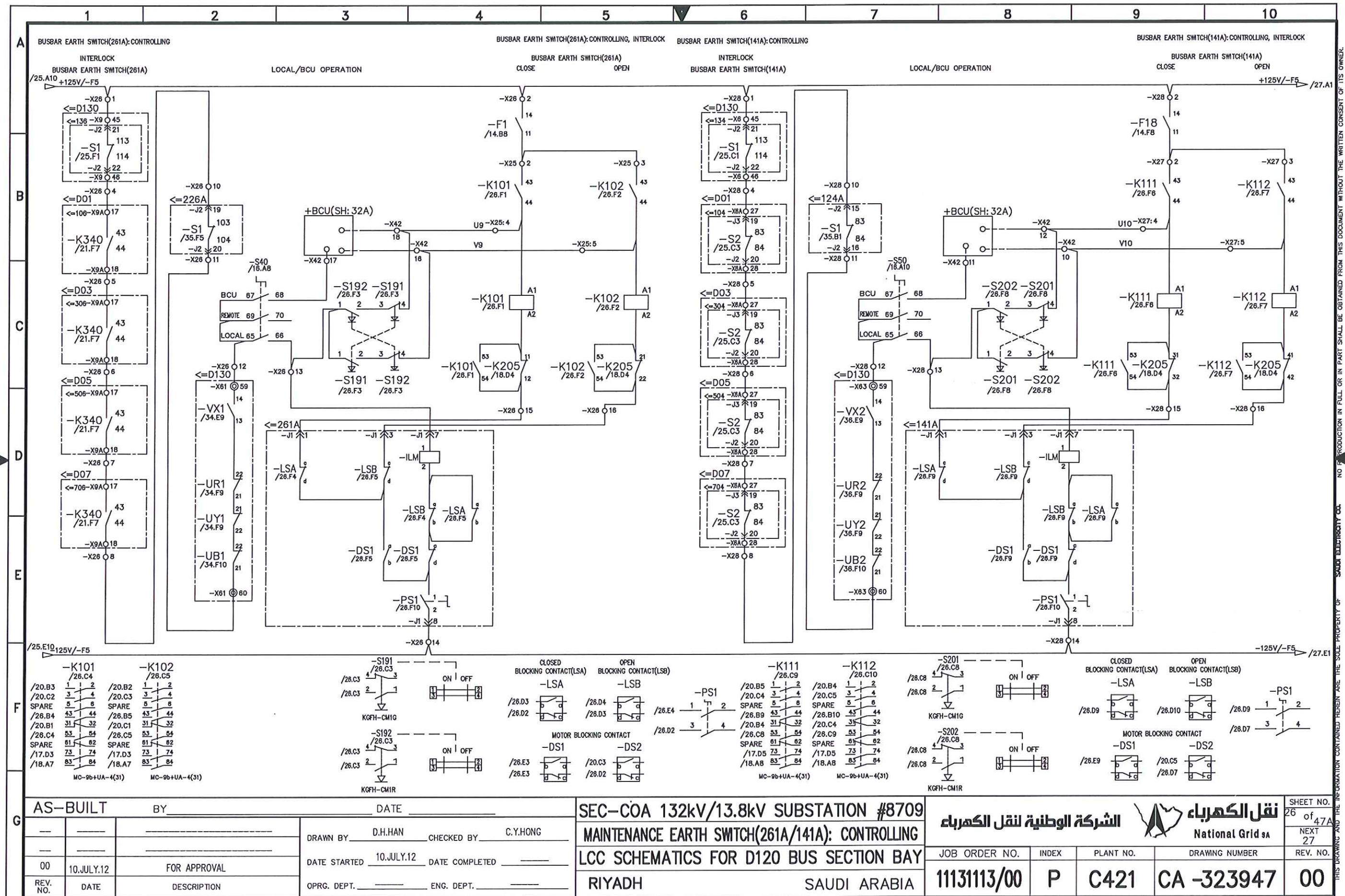
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			DRAWN BY D.H.HAN CHECKED BY C.Y.HONG			INTERLOCK OF BUSBAR DISCONNECTOR(226A/226B)			National Grid sa			NEXT 24	
			DATE STARTED 10.JULY.12 DATE COMPLETED _____			LCC SCHEMATICS FOR D120 BUS SECTION BAY			JOB ORDER NO. 11131113/00			REV. NO. 00	
REV. NO.			DATE			RIYADH SAUDI ARABIA			INDEX P			DRAWING NUMBER CA-323947	
			DESCRIPTION						PLANT NO. C421				



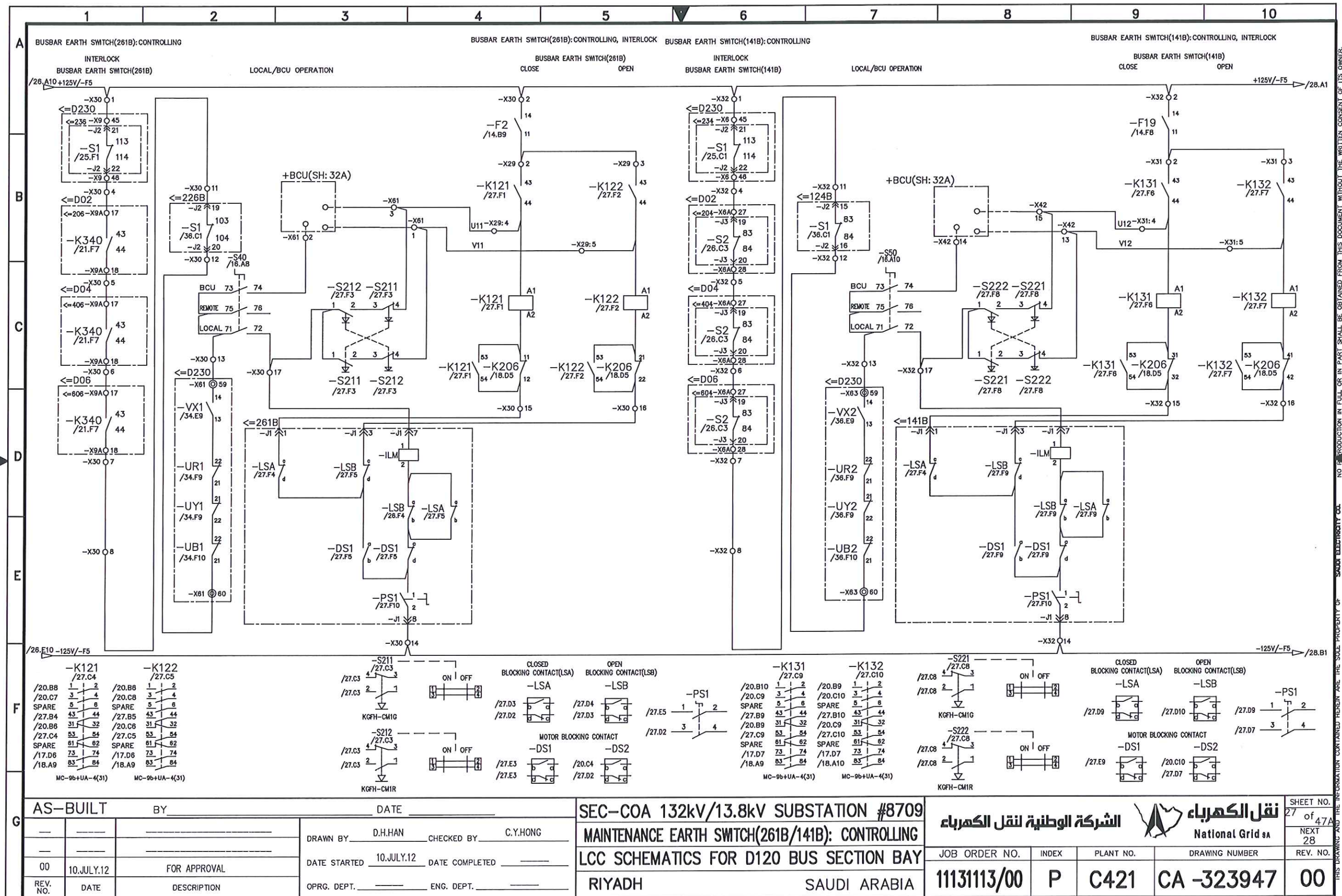
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00	10.JULY.12	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	

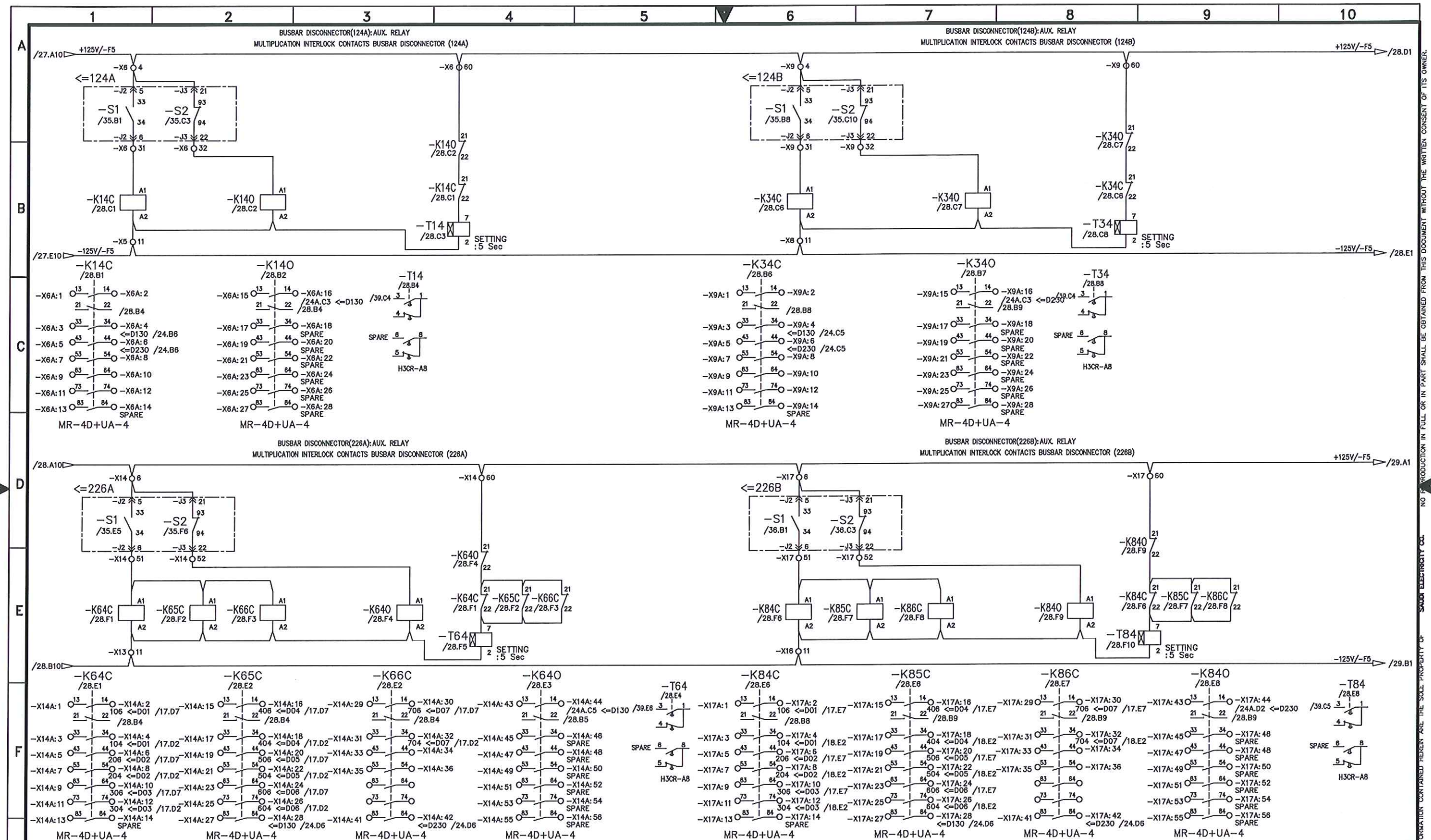
SEC-COA 132kV/13.8kV SUBSTATION #8709	
BUSBAR DISCONNECTOR WITH MAINTENANCE EARTH SWITCH(226B/221B): CONTROLLING	
LCC SCHEMATICS FOR D120 BUS SECTION BAY	
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa	
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER
11131113/00	P	C421	CA -323947
SHEET NO. 25 of 47A		REV. NO. 00	

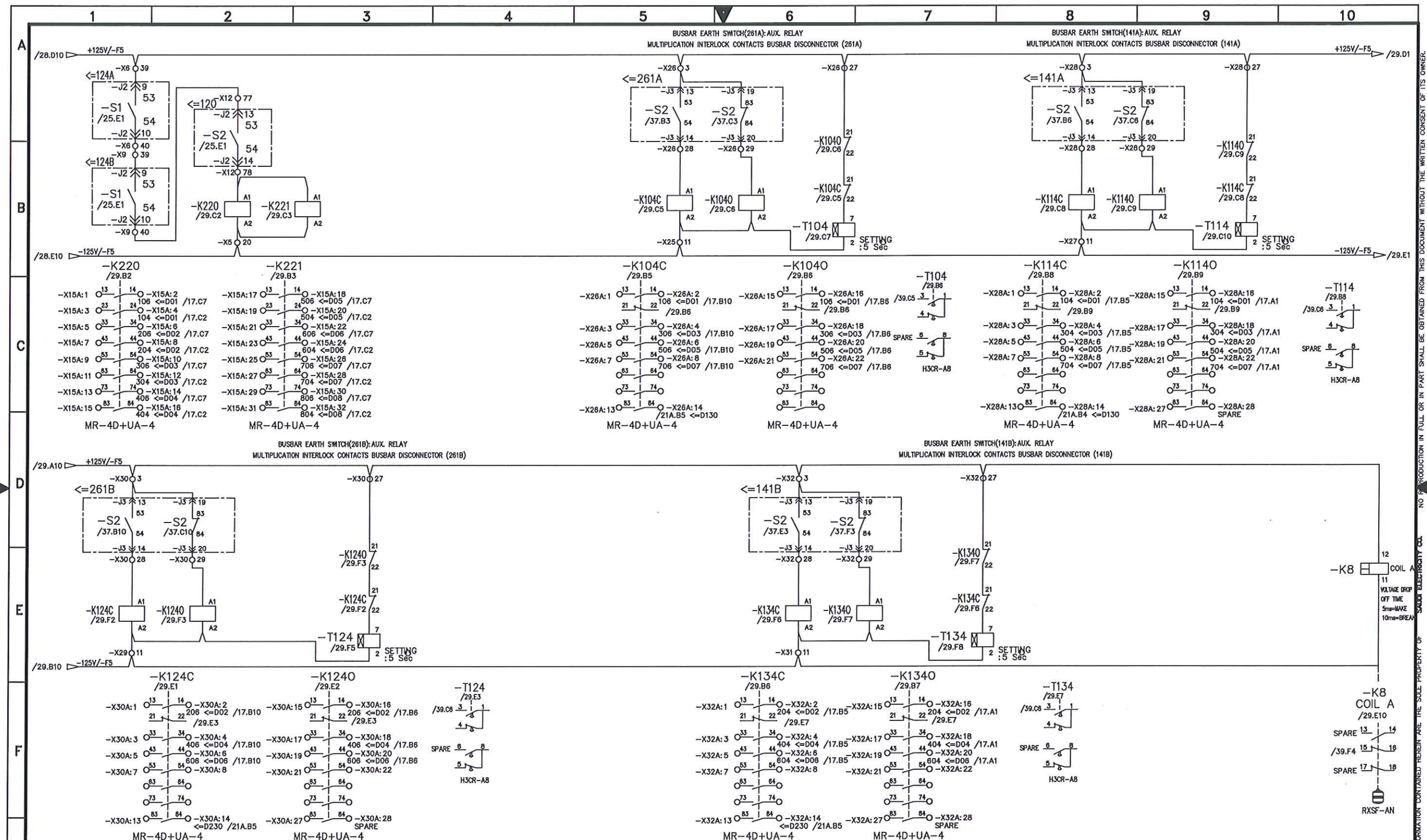


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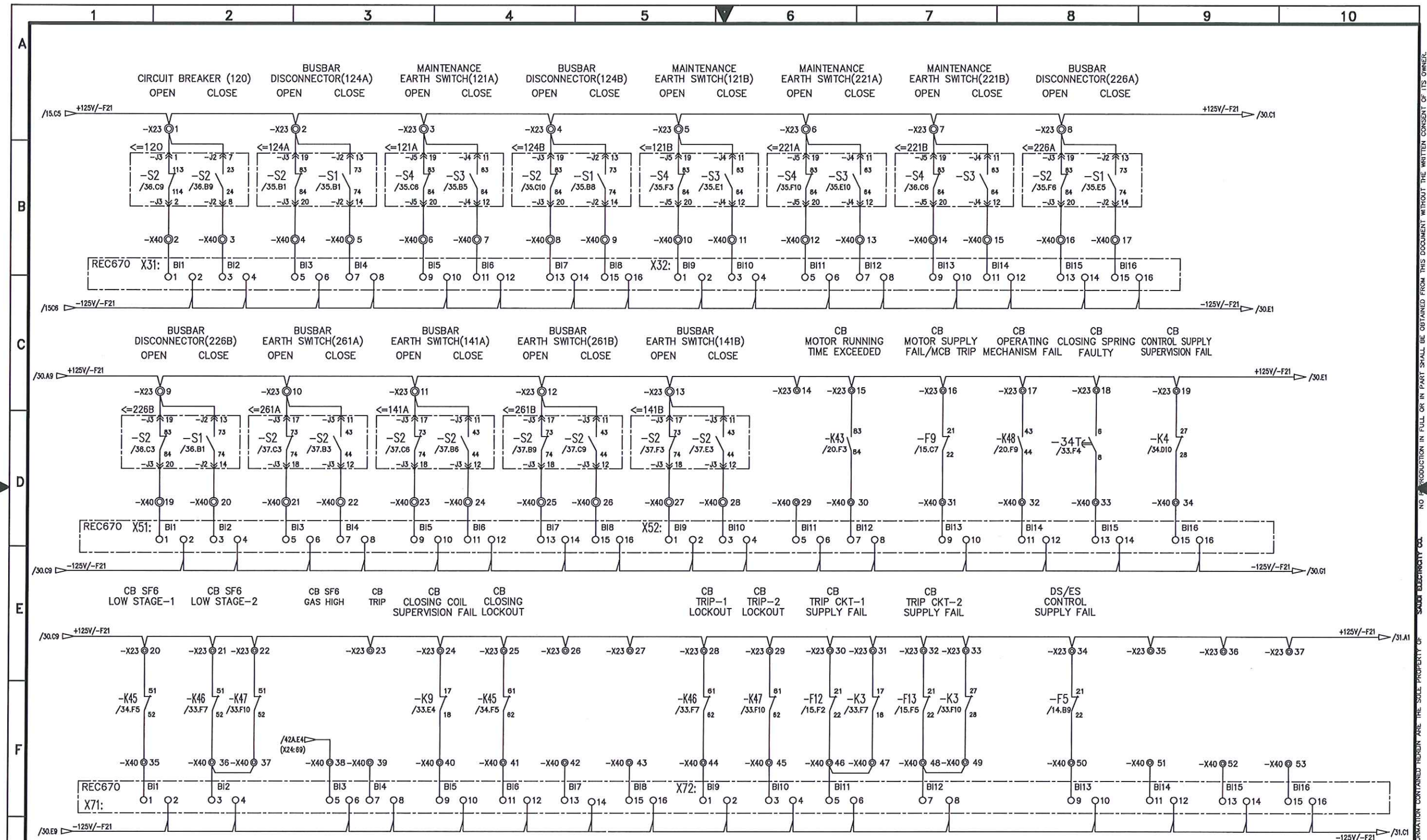




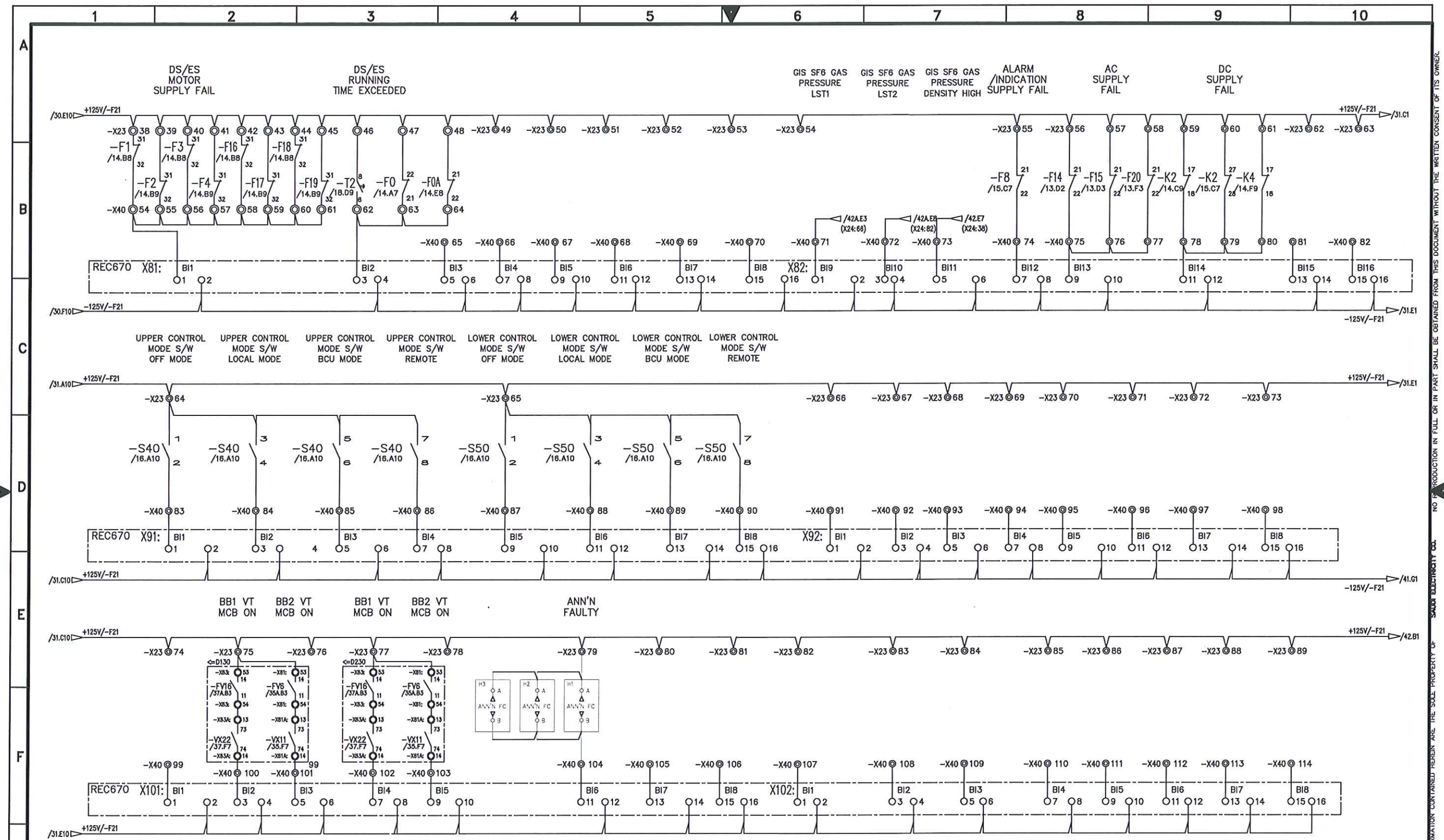
AS-BUILT			BY		DATE		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء		National Grid sa		SHEET NO. 28 of 47A	
							BUSBAR DISCONNECTOR(124A/124B/226A/226B): AUX. RELAY								NEXT 29	
							LCC SCHEMATICS FOR D120 BUS SECTION BAY								REV. NO.	
							RIYADH SAUDI ARABIA				JOB ORDER NO. 1113113/00		INDEX P		PLANT NO. C421	
															DRAWING NUMBER CA-323947	
															REV. NO. 00	



G	AS-BUILT			BY	DATE		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء				National Grid		SHEET NO. 29 of 47A		
						DRAWN BY D.H.HAN		CHECKED BY C.Y.HONG		BUSBAR EARTH SWITCH(261A/141A/261B/141B): AUX. RELAY				NEXT 30					
						DATE STARTED 10.JULY.12		DATE COMPLETED		LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO.		INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
	00			10.JULY.12		FOR APPROVAL				RIYADH				11131113/00		P	C421	CA -323947	00
	REV. NO.			DATE		DESCRIPTION		OPRG. DEPT.		ENG. DEPT.		SAUDI ARABIA							



AS-BUILT			BY		DATE		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO. 30 of 47A	
							SIGNALLING FOR BCU 1				National Grid sa		NEXT 31		REV. NO.	
							LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO.		INDEX		PLANT NO.	
							RIYADH SAUDI ARABIA				11131113/00		P		C421	
															CA -323947	
															00	



AS-BUILT

BY

DATE

SEC-COA 132kV/13.8kV SUBSTATION #8709

SIGNALLING FOR BCU 2

LCC SCHEMATICS FOR D120 BUS SECTION BAY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

JOB ORDER NO.

INDEX

PLANT NO.

DRAWING NUMBER

11131113/00

P

C421

CA -323947

SHEET NO.

31 of 47

NEXT

32

REV. NO.

00

SEC-D (2004/10)

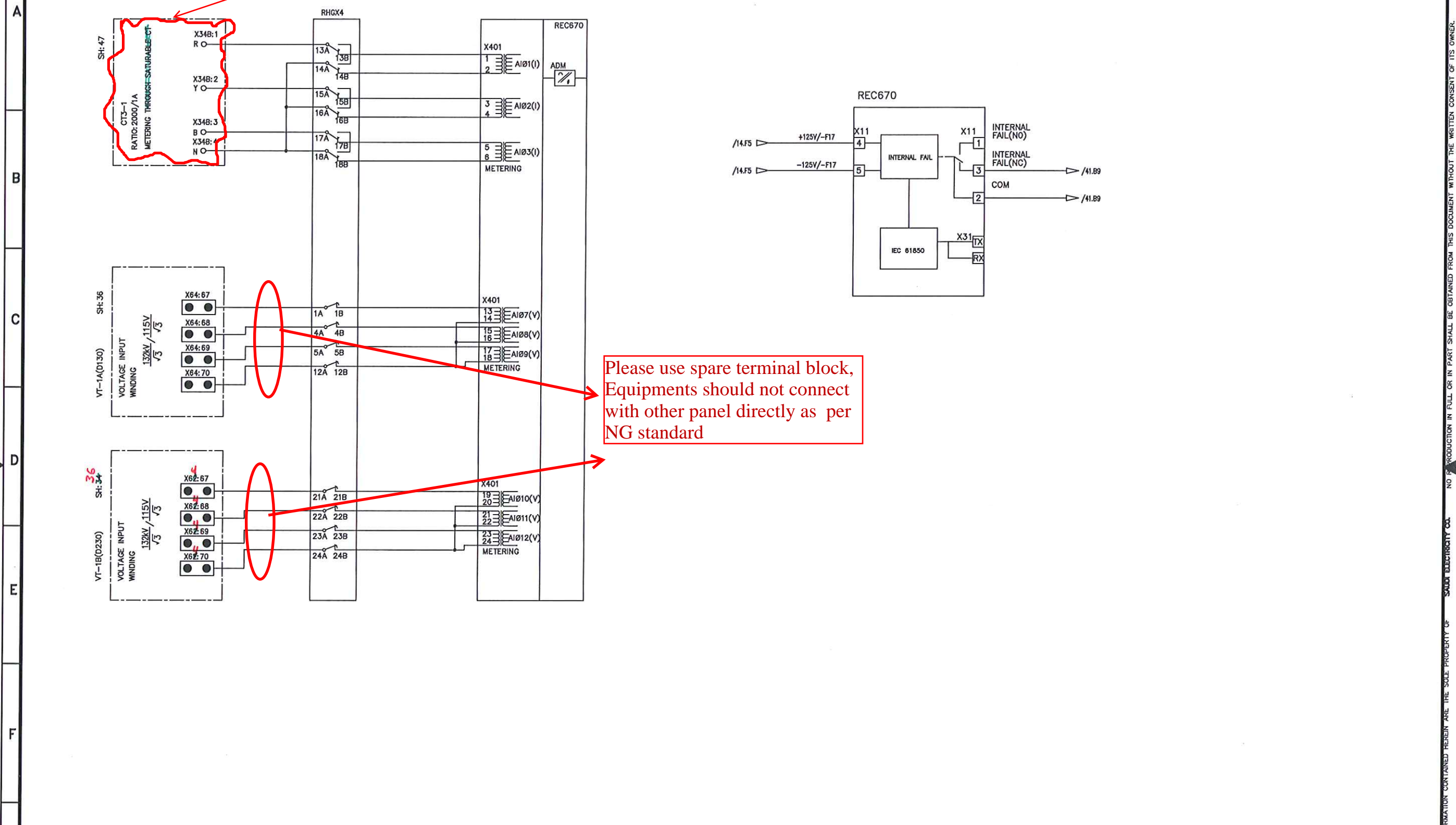
EDMS

VECTOR

SECE00

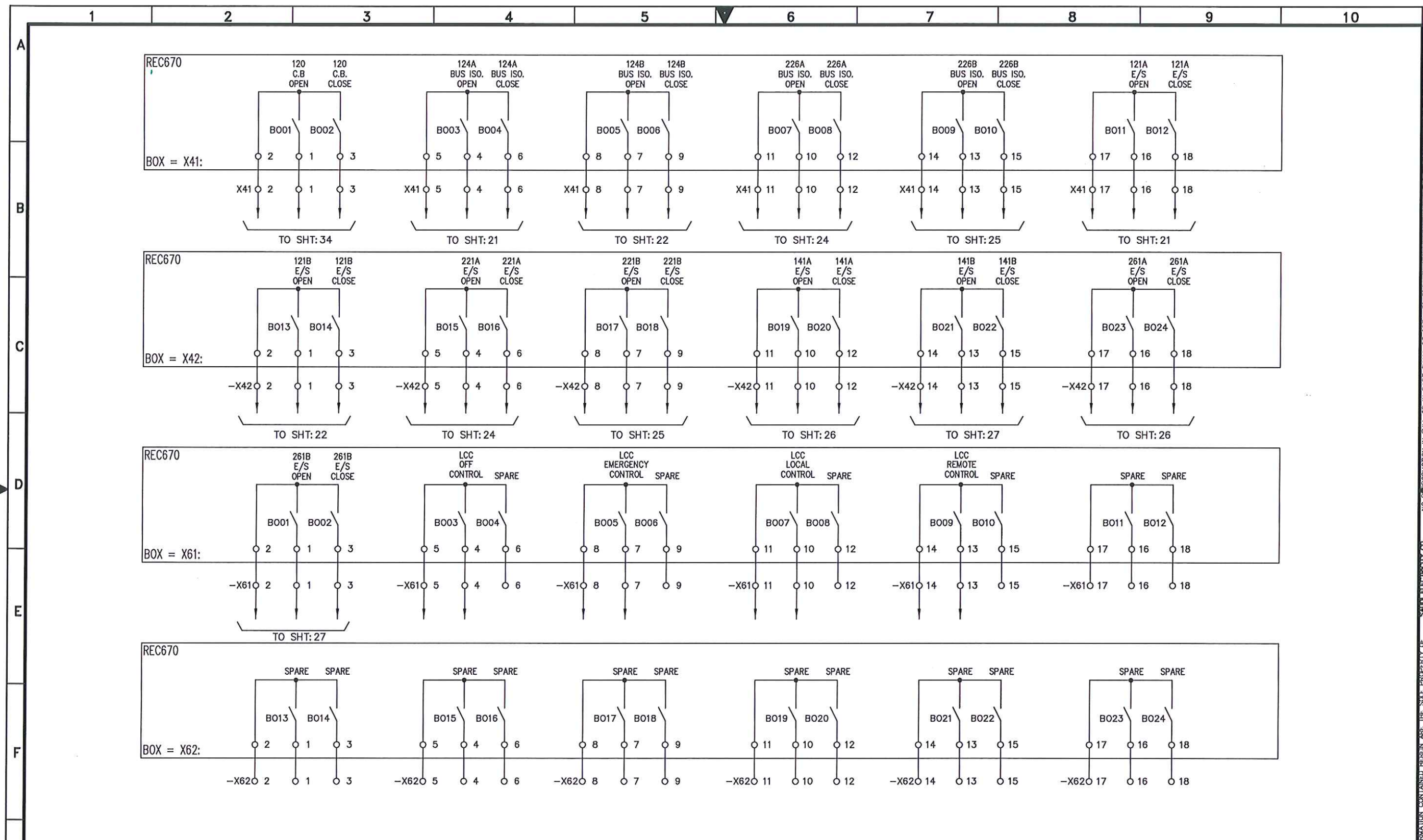
Please remove panel boundary

1 2 3 4 5 6 7 8 9 10



Please use spare terminal block, Equipments should not connect with other panel directly as per NG standard

AS-BUILT			BY _____		DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO. 32 of 47A	
			DRAWN BY C.Y.HONG		CHECKED BY C.Y.HONG		SIGNALLING FOR BCU CT/VT INPUT				National Grid sa		NEXT 32A		REV. NO.	
00			10.JULY.12		FOR APPROVAL		LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO.		INDEX		PLANT NO.	
REV. NO.			DATE		DESCRIPTION		RIYADH SAUDI ARABIA				11131113/00		P		C421	
															CA -323947	
															00	

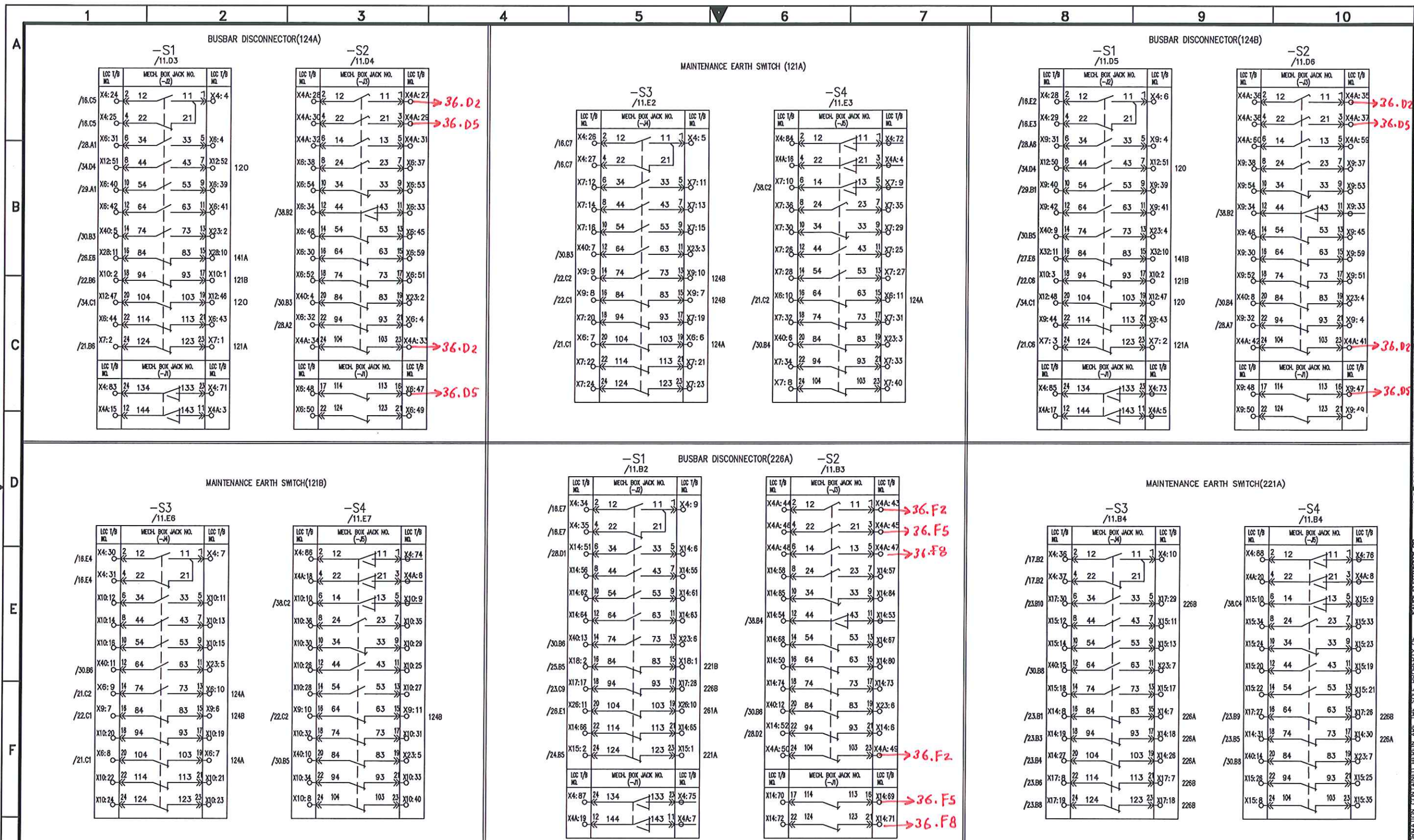


AS-BUILT		BY	DATE	SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.
				DRAWN BY: C.Y.HONG CHECKED BY: C.Y.HONG		National Grid sa				32A of 47A
				DATE STARTED 10.JULY.12 DATE COMPLETED		JOB ORDER NO.		INDEX		NEXT
00		10.JULY.12	FOR APPROVAL	OPRG. DEPT. ENG. DEPT.		11131113/00		P		33
REV. NO.		DATE	DESCRIPTION	LCC SCHEMATICS FOR D120 BUS SECTION BAY		PLANT NO.		DRAWING NUMBER		REV. NO.
				RIYADH SAUDI ARABIA		C421		CA -323947		00

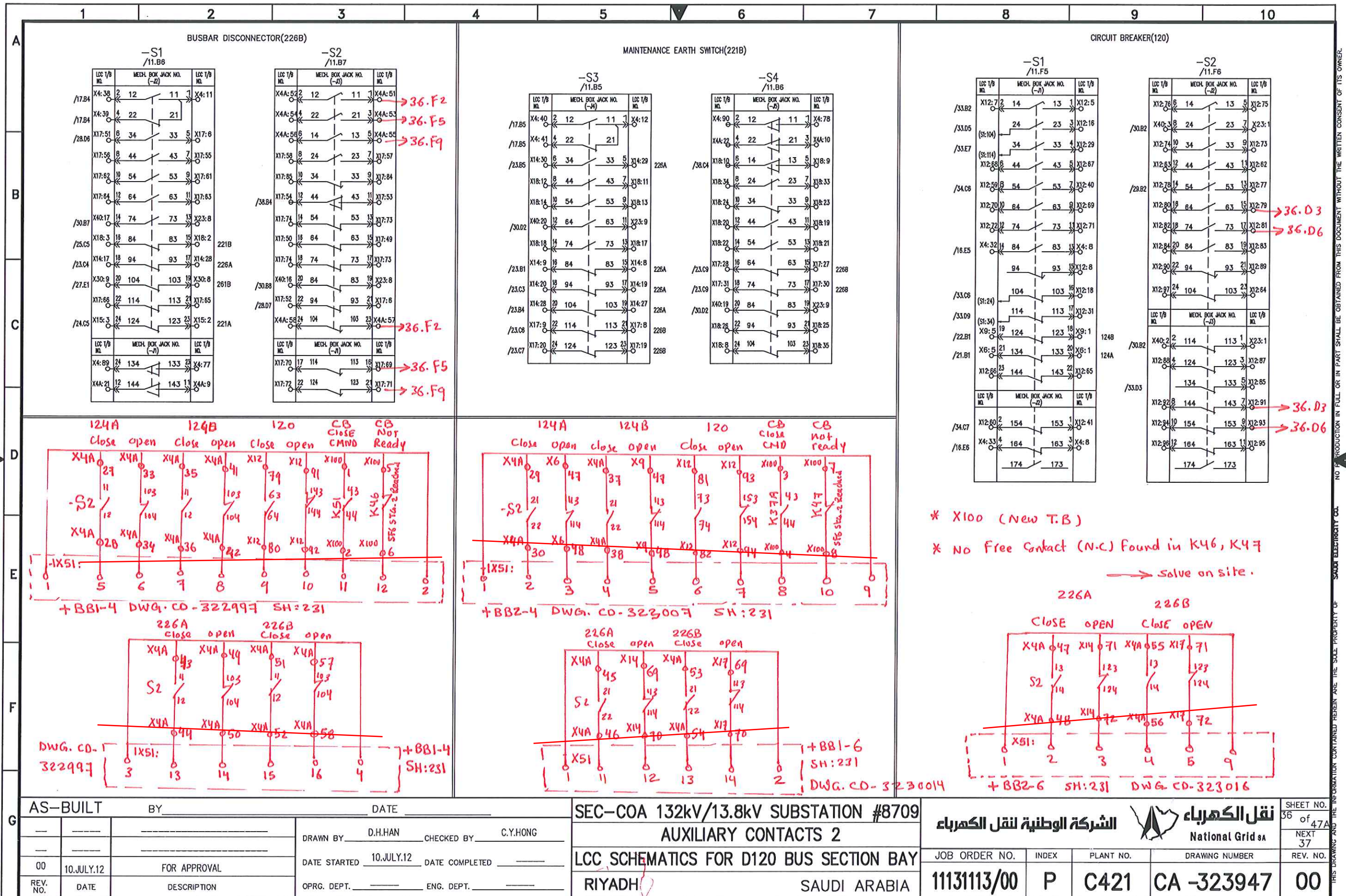
SEC-D (2004/10)

EDMS VECTOR SECE00

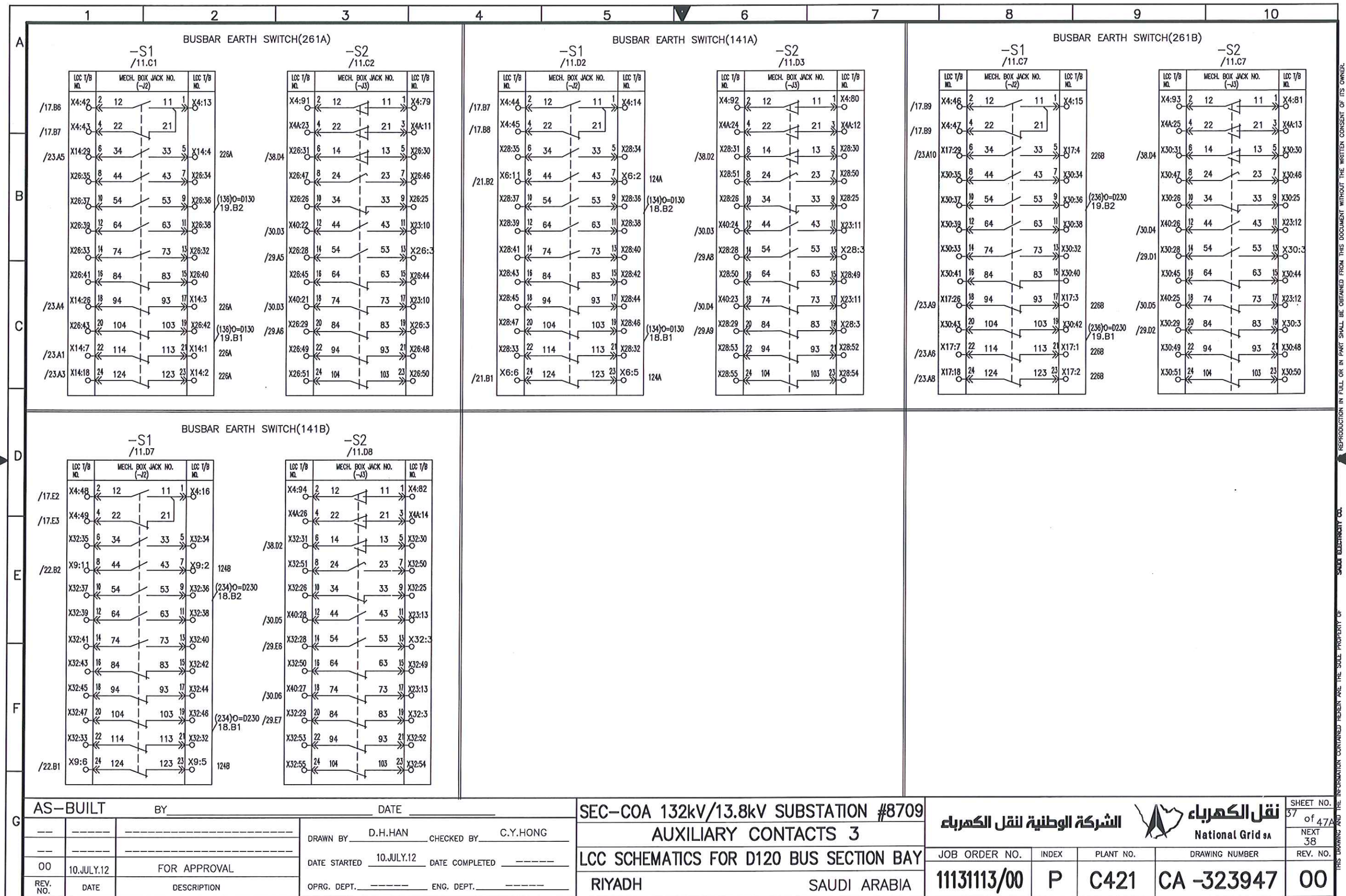
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AS-BUILT		BY _____ DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		SHEET NO. 35 of 47	
		DRAWN BY D.H.HAN CHECKED BY C.Y.HONG		AUXILIARY CONTACTS 1		National Grid sa		NEXT 36	
		DATE STARTED 10.JULY.12 DATE COMPLETED _____		LCC SCHEMATICS FOR D120 BUS SECTION BAY		JOB ORDER NO. 11131113/00		INDEX P	
		OPRG. DEPT. _____ ENG. DEPT. _____		RIYADH SAUDI ARABIA		PLANT NO. C421		DRAWING NUMBER CA -323947	
REV. NO. 00		DATE 10.JULY.12				11131113/00		00	
DESCRIPTION									



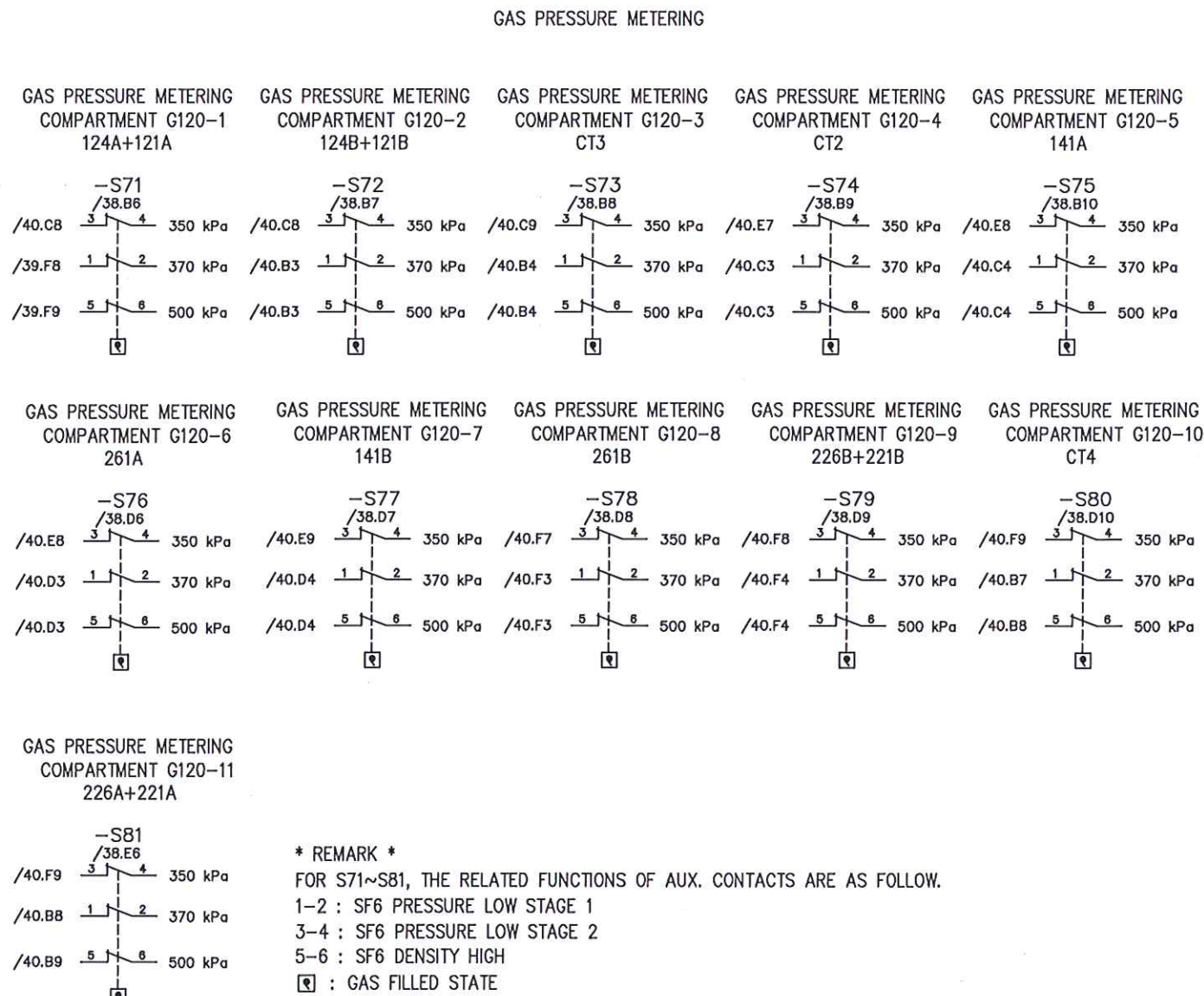
NO PRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



REPRODUCTION IN FULL OR IN PART SHALL BE OBTAINED FROM THIS DOCUMENT WITHOUT THE WRITTEN CONSENT OF ITS OWNER.



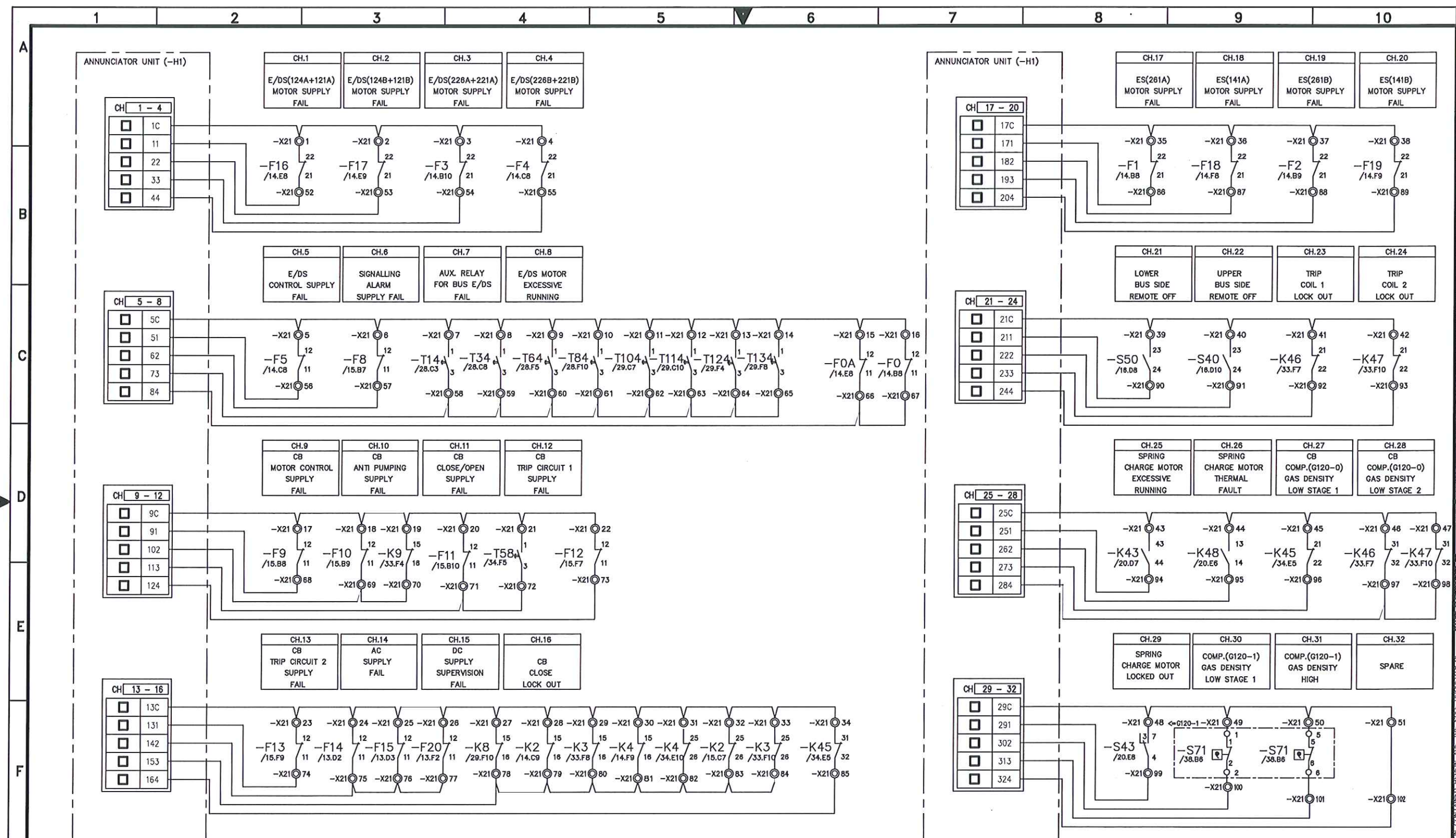
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JOB ORDER NO.		INDEX		PLANT NO.		DRAWING NUMBER	
11131113/00		P		C421		CA -323947	
REV. NO.		REV. NO.		REV. NO.		REV. NO.	
00		00		00		00	



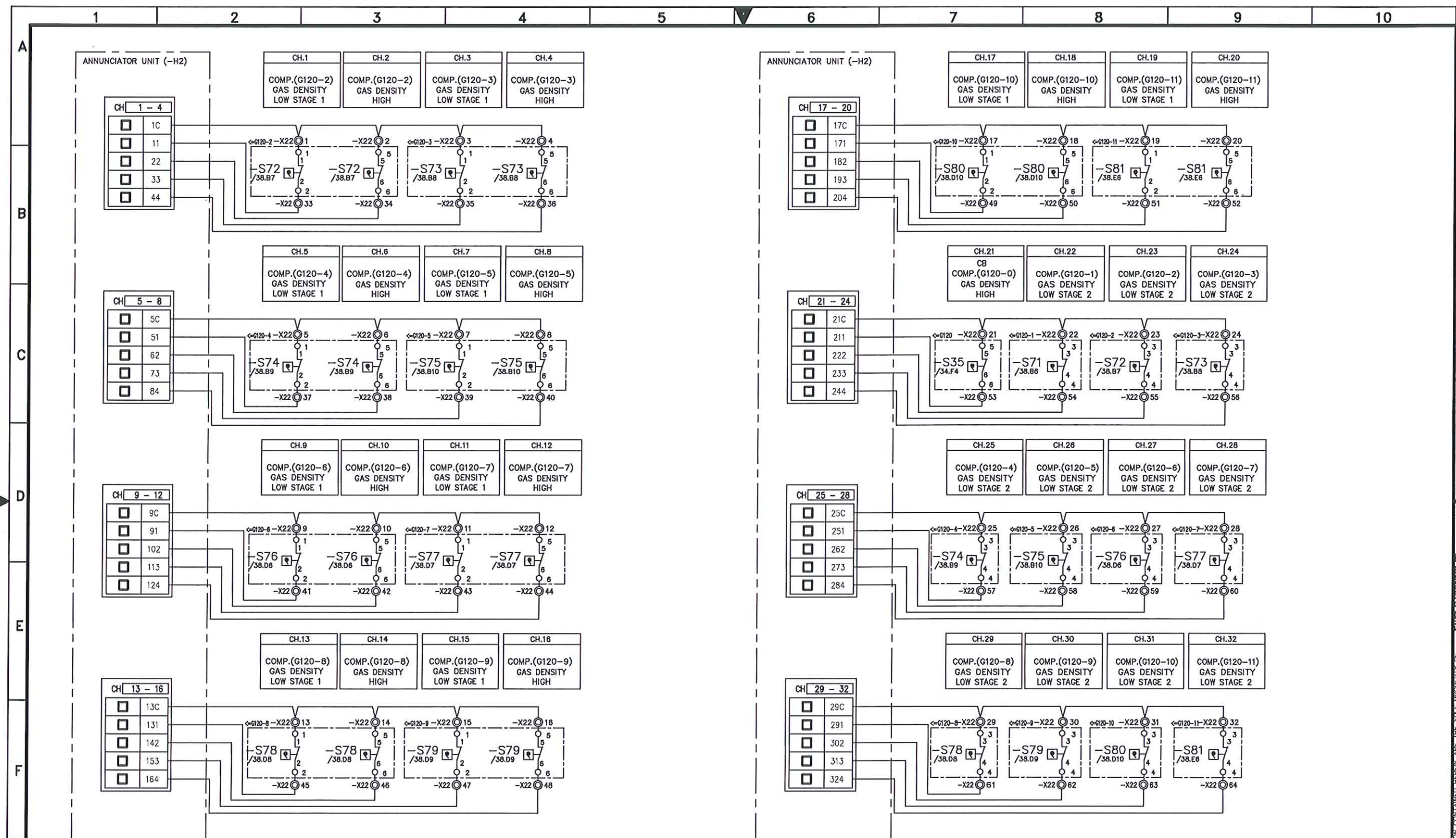
AS-BUILT			BY _____	DATE _____
—	—	—	DRAWN BY <u>D.H.HAN</u> CHECKED BY <u>C.Y.HONG</u>	DATE STARTED <u>10.JULY.12</u> DATE COMPLETED _____
—	—	—		
00	10.JULY.12	FOR APPROVAL		
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. _____ ENG. DEPT. _____	

SEC-COA 132kV/13.8kV SUBSTATION #8709
DS/ES SWITCHING INCOMPLETE & GAS PRESSURE METERING
LCC SCHEMATICS FOR D120 BUS SECTION BAY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء  نقل الكهرباء National Grid sa				SHEET NO. 58 of 47A NEXT 39
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
11131113/00	P	C421	CA -323947	00

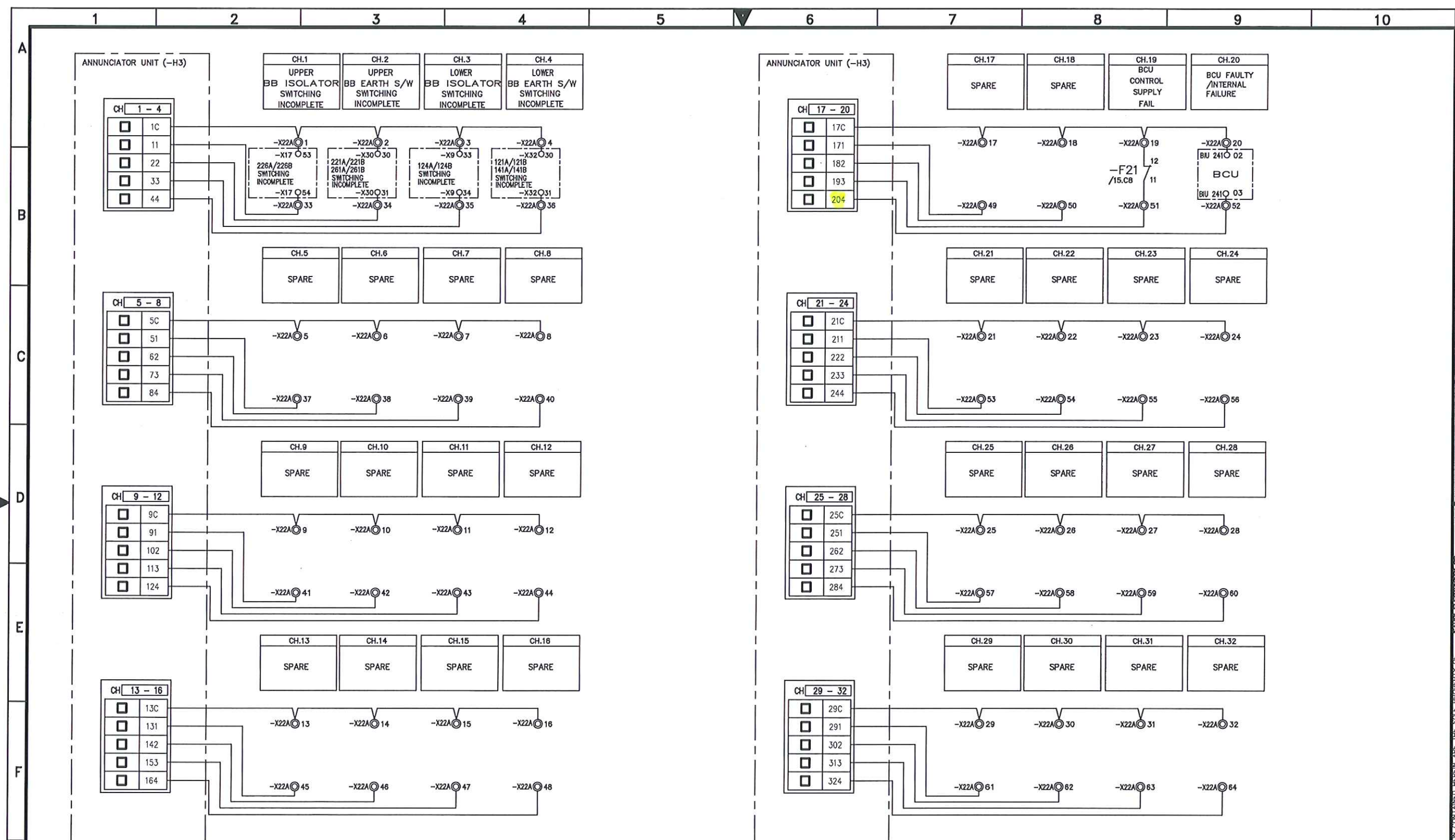


AS-BUILT			BY		DATE		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.	
							SIGNALLING : INPUT ANNUNCIATOR 1				National Grid sa		39 of 47A		NEXT	
							LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO.		INDEX		PLANT NO.	
							RIYADH SAUDI ARABIA				11131113/00		P		C421	
											DRAWING NUMBER		CA -323947		REV. NO.	
															00	

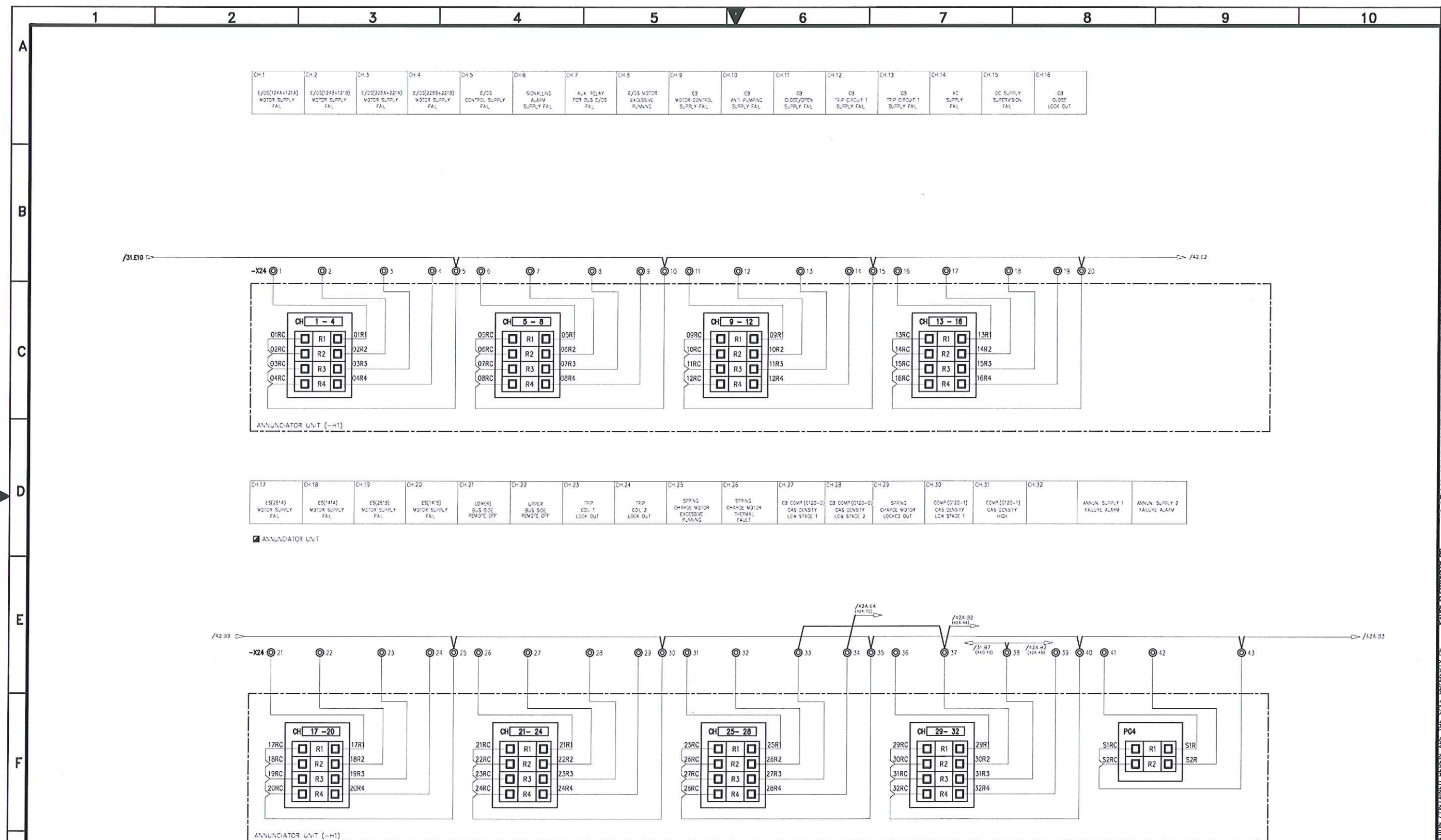


AS-BUILT				BY _____ DATE _____				SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء				SHEET NO. 40 of 47A	
				DRAWN BY D.H.HAN CHECKED BY C.Y.HONG				SIGNALLING : INPUT ANNUNCIATOR 2				National Grid sa				NEXT 41	
				DATE STARTED 10.JULY.12 DATE COMPLETED _____				LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO. 11131113/00				REV. NO. 00	
REV. NO. 00				OPRG. DEPT. _____ ENG. DEPT. _____				RIYADH SAUDI ARABIA				INDEX P				DRAWING NUMBER CA -323947	
DATE 10.JULY.12				FOR APPROVAL				C421				PLANT NO. 11131113/00				REVISION 00	
DESCRIPTION								SEC-D (2004/10)				EDMS VECTOR				SECE00	

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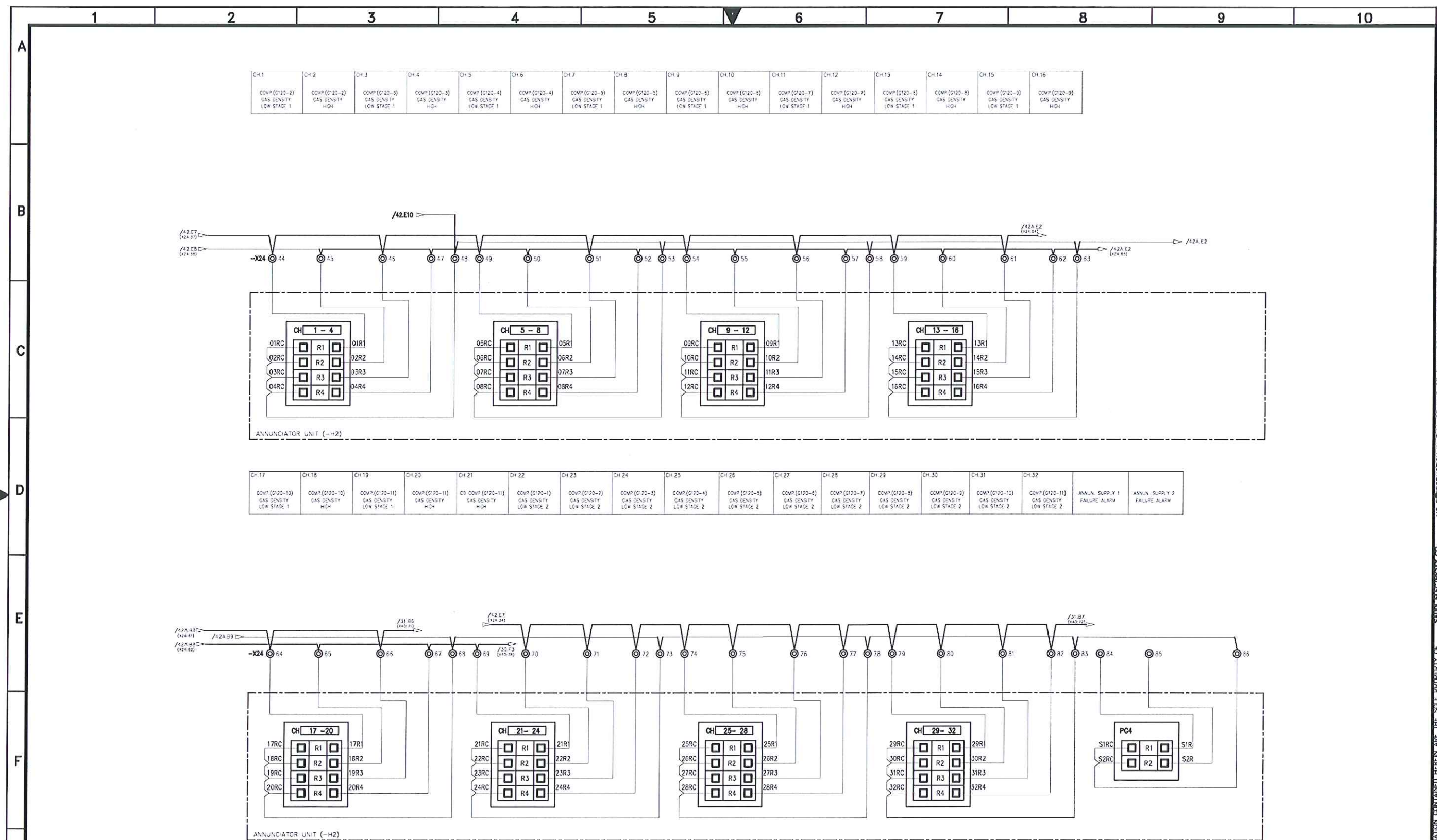
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				DRAWN BY D.H.HAN CHECKED BY C.Y.HONG				SIGNALLING : INPUT ANNUNCIATOR 3				National Grid sa				NEXT 42	
				DATE STARTED 10.JULY.12 DATE COMPLETED _____				LCC SCHEMATICS FOR D120 BUS SECTION BAY				JOB ORDER NO. 11131113/00				REV. NO. 00	
00				FOR APPROVAL				RIYADH SAUDI ARABIA				INDEX P				DRAWING NUMBER CA -323947	
REV. NO.				DATE								PLANT NO. C421					
				DESCRIPTION													
				OPRG. DEPT. _____ ENG. DEPT. _____													



AS-BUILT				BY				DATE				SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء				National Grid sa				SHEET NO. 42 of 47A			
DRAWN BY D.H.HAN				CHECKED BY C.Y.HONG				DATE STARTED 10.JULY.12				DATE COMPLETED				NEXT 42A				REV. NO.				REV. NO.			
00				10.JULY.12				FOR APPROVAL				OPRG. DEPT.				ENG. DEPT.				JOB ORDER NO. 11131113/00				INDEX P			
REV. NO.				DATE				DESCRIPTION				PLANT NO. C421				DRAWING NUMBER CA -323947				00				00			

SEC-COA 132kV/13.8kV SUBSTATION #8709
 SIGNALLING : OUTPUT ANNUNCIATOR 1
 LCC SCHEMATICS FOR D120 BUS SECTION BAY
 RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
 National Grid sa
 JOB ORDER NO. 11131113/00
 INDEX P
 PLANT NO. C421
 DRAWING NUMBER CA -323947
 SHEET NO. 42 of 47A
 NEXT 42A
 REV. NO. 00



AS-BUILT		BY	DATE
00	10.JULY.12	FOR APPROVAL	
REV. NO.	DATE	DESCRIPTION	

DRAWN BY	D.H.HAN	CHECKED BY	C.Y.HONG
DATE STARTED	10.JULY.12	DATE COMPLETED	
OPRG. DEPT.		ENG. DEPT.	

SEC-COA 132kV/13.8kV SUBSTATION #8709
 SIGNALLING : OUTPUT ANNUNCIATOR 2
 LCC SCHEMATICS FOR D120 BUS SECTION BAY
 RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa	
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER
11131113/00	P	C421	CA -323947

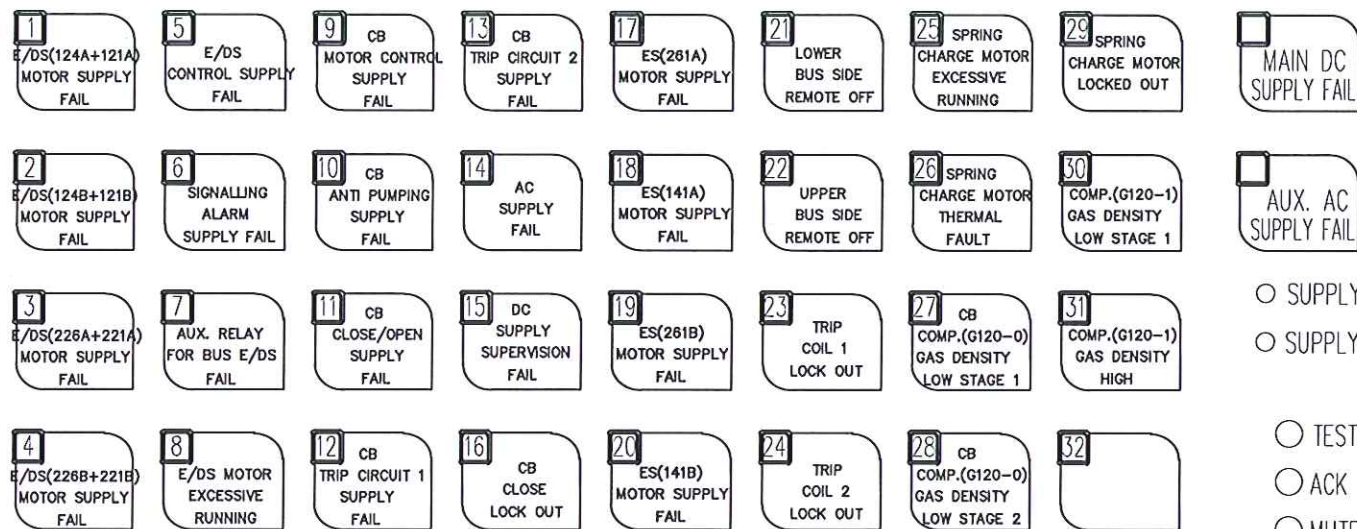
SHEET NO.	42A of 47A
NEXT	43
REV. NO.	00



AS-BUILT			BY _____		DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709				الشركة الوطنية لنقل الكهرباء		National Grid sa		SHEET NO. 43 of 47	
							DRAWN BY D.H.HAN CHECKED BY C.Y.HONG								NEXT 44	
00			10.JULY.12		FOR APPROVAL		DATE STARTED 10.JULY.12 DATE COMPLETED _____				JOB ORDER NO. 11131113/00		INDEX P		REV. NO. 00	
REV. NO.			DATE		DESCRIPTION		OPRG. DEPT. _____ ENG. DEPT. _____				PLANT NO. C421		DRAWING NUMBER CA -323947			
							RIYADH SAUDI ARABIA									

-H1

RTK



UC625

CH.NO. DELAY(SEC.) LED COLOR

1	5mS	YELLOW
2	5mS	YELLOW
3	5mS	YELLOW
4	5mS	YELLOW
5	5mS	YELLOW
6	5mS	YELLOW
7	5mS	YELLOW
8	5mS	YELLOW
9	5mS	YELLOW
10	5mS	YELLOW
11	5mS	YELLOW
12	5mS	YELLOW
13	5mS	YELLOW
14	5mS	YELLOW
15	5mS	YELLOW
16	5S	YELLOW

CH.NO. DELAY(SEC.) LED COLOR

17	5mS	YELLOW
18	5mS	YELLOW
19	5mS	YELLOW
20	5mS	YELLOW
21	5mS	YELLOW
22	5mS	YELLOW
23	5S	YELLOW
24	5S	YELLOW
25	5mS	YELLOW
26	5mS	YELLOW
27	5S	YELLOW
28	5S	YELLOW
29	5mS	YELLOW
30	5S	YELLOW
31	5S	YELLOW
32	5mS	YELLOW

- 1) MAKER : RTK INSTRUMENTS
- 2) MODEL : UC625-32YW-HH-024-R-M3
- 3) SUPPLY VOLTAGE
 - MAIN SUPPLY : DC 125V
 - AUX. SUPPLY : AC 230V
- 4) LED COLOR : YELLOW
- 5) DELAYED TIME
 - CH16, CH23, CH24, CH27, CH28, CH30, CH31 : 5 SEC.
 - OTHERS : 5 mSEC.

AS-BUILT

BY _____ DATE _____

DRAWN BY D.H.HAN CHECKED BY C.Y.HONG

DATE STARTED 10.JULY.12 DATE COMPLETED _____

OPRG. DEPT. _____ ENG. DEPT. _____

SEC-COA 132kV/13.8kV SUBSTATION #8709

SIGNALLING : FRONT COMMENT ANNUNCIATOR 1

LCC SCHEMATICS FOR D120 BUS SECTION BAY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.
		National Grid sa		44 of 47A
JOB ORDER NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.
11131113/00	P	C421	CA -323947	00

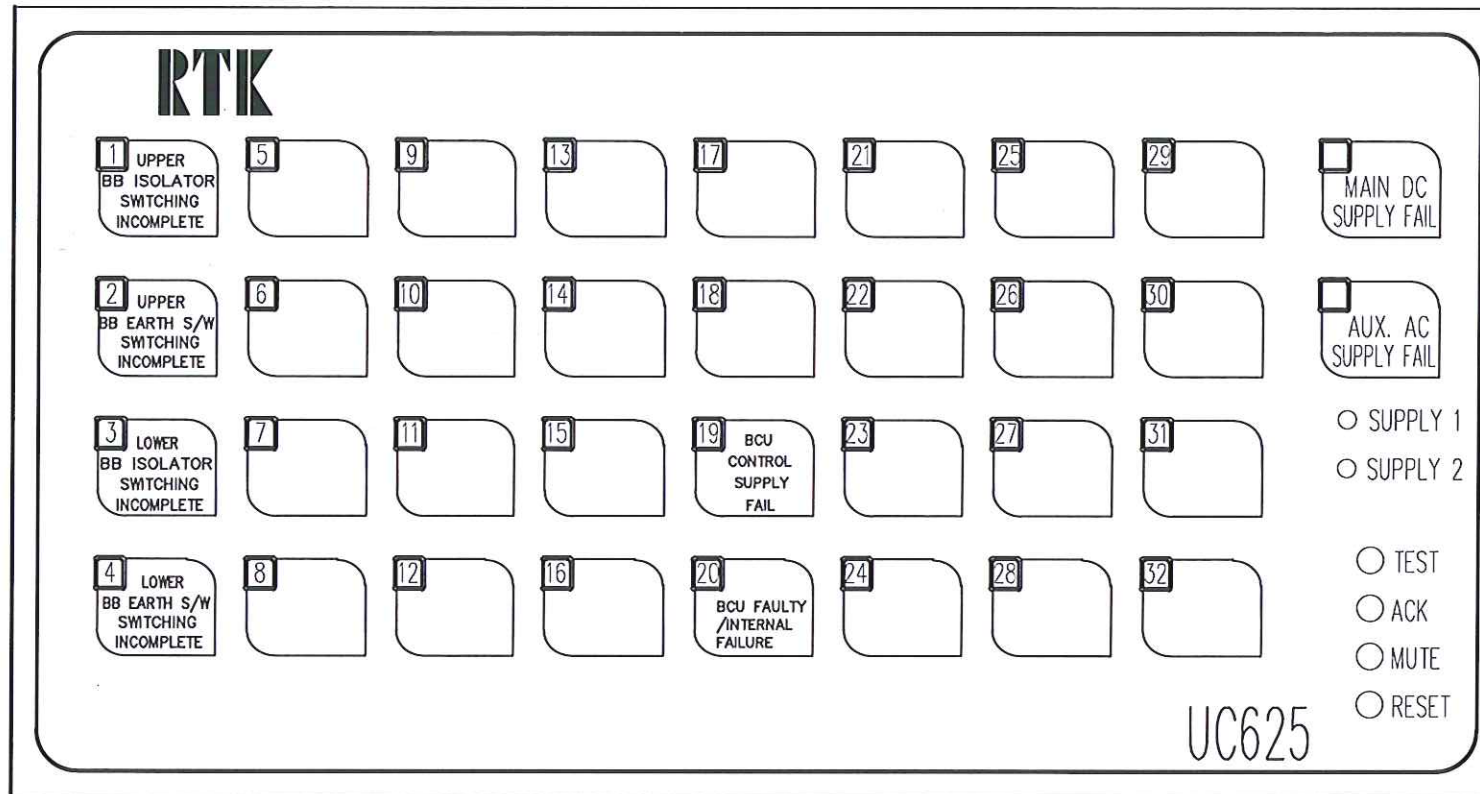
SEC-D (2004/10)

EDMS

VECTOR

SECE00

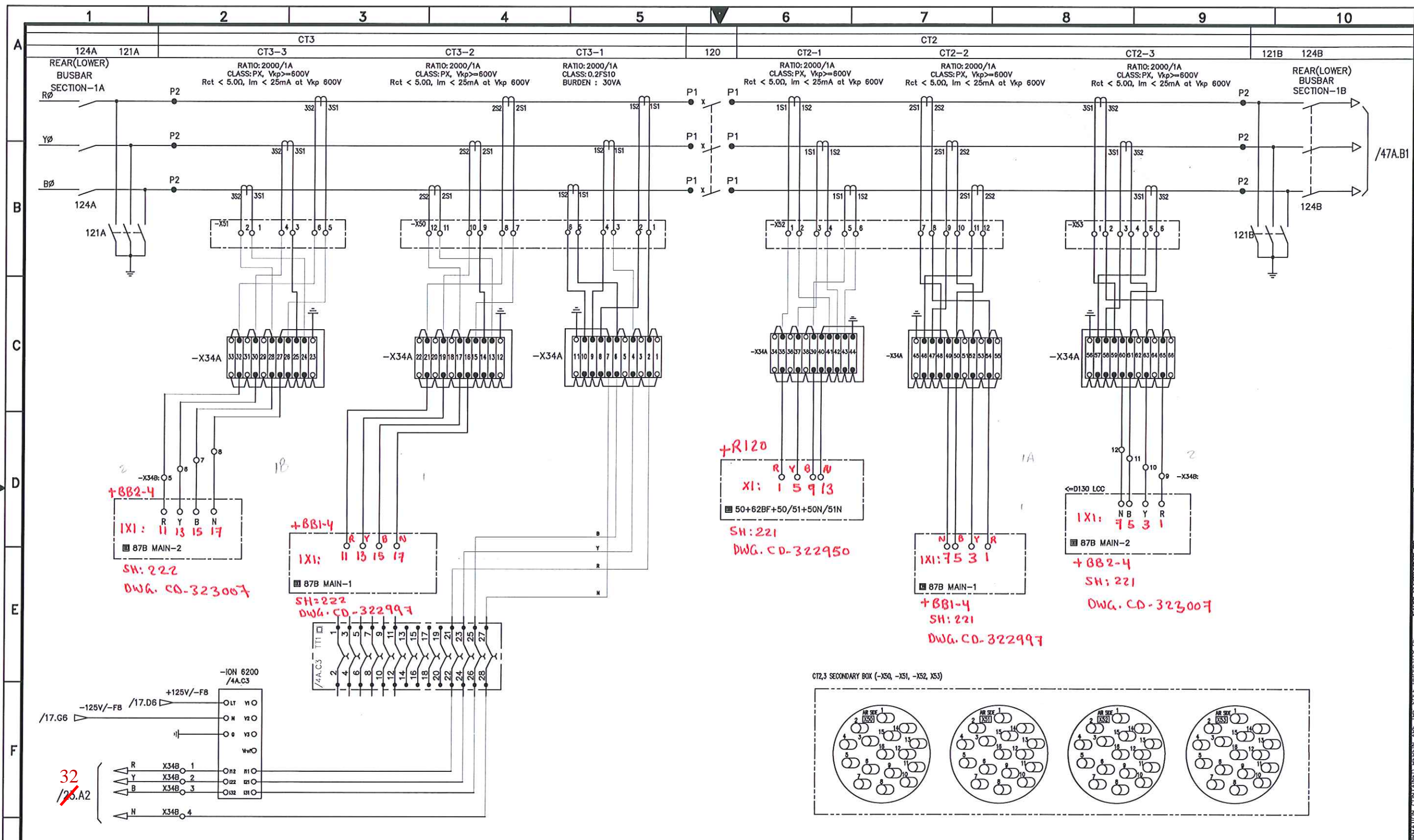
-H3



CH.NO.	DELAY (SEC.)	LED COLOR	CH.NO.	DELAY (SEC.)	LED COLOR
1	5S	YELLOW	17	5mS	YELLOW
2	5S	YELLOW	18	5mS	YELLOW
3	5S	YELLOW	19	5mS	YELLOW
4	5S	YELLOW	20	5mS	YELLOW
5	5mS	YELLOW	21	5mS	YELLOW
6	5mS	YELLOW	22	5mS	YELLOW
7	5mS	YELLOW	23	5mS	YELLOW
8	5mS	YELLOW	24	5mS	YELLOW
9	5mS	YELLOW	25	5mS	YELLOW
10	5mS	YELLOW	26	5mS	YELLOW
11	5mS	YELLOW	27	5mS	YELLOW
12	5mS	YELLOW	28	5mS	YELLOW
13	5mS	YELLOW	29	5mS	YELLOW
14	5mS	YELLOW	30	5mS	YELLOW
15	5mS	YELLOW	31	5mS	YELLOW
16	5mS	YELLOW	32	5mS	YELLOW

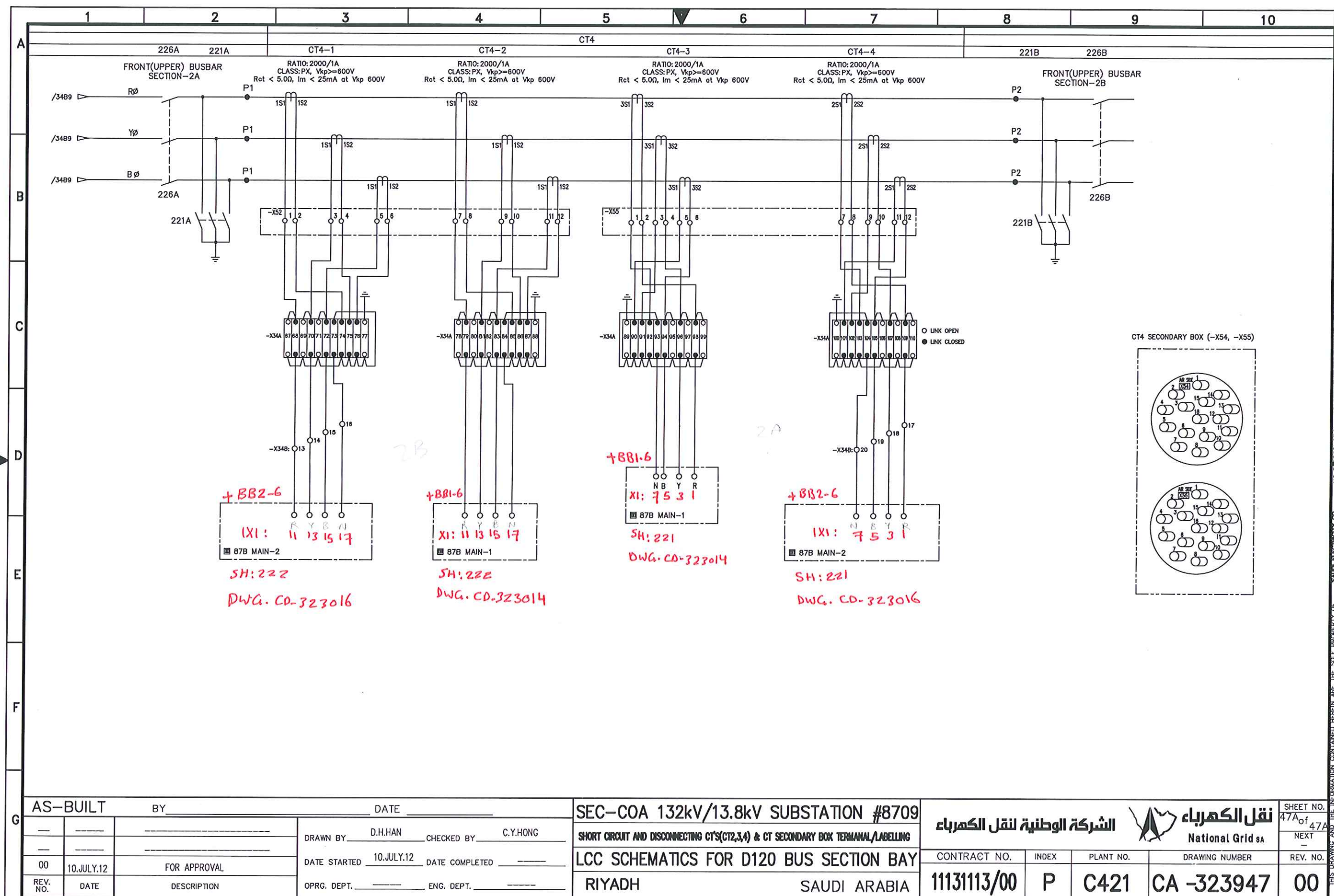
- 1) MAKER : RTK INSTRUMENTS
- 2) MODEL : UC625-32YW-HH-024-R-M3
- 3) SUPPLY VOLTAGE
 - MAIN SUPPLY : DC 125V
 - AUX. SUPPLY : AC 230V
- 4) LED COLOR : YELLOW
- 5) DELAYED TIME
 - CH1~CH4 : 5 SEC.
 - OTHERS : 5 mSEC.

AS-BUILT		BY	DATE	SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		SHEET NO.	
				DRAWN BY D.H.HAN CHECKED BY C.Y.HONG		National Grid sa		46 of 47A			
				DATE STARTED 10.JULY.12 DATE COMPLETED		JOB ORDER NO.		INDEX		NEXT	
00		10.JULY.12	FOR APPROVAL	OPRG. DEPT. ENG. DEPT.		11131113/00		P		47	
REV. NO.		DATE	DESCRIPTION	LCC SCHEMATICS FOR D120 BUS SECTION BAY		PLANT NO.		DRAWING NUMBER		REV. NO.	
				RIYADH SAUDI ARABIA		C421		CA -323947		00	



AS-BUILT			BY _____ DATE _____		SEC-COA 132kV/13.8kV SUBSTATION #8709		الشركة الوطنية لنقل الكهرباء		National Grid sa		SHEET NO. 47 of 47A	
			DRAWN BY: D.H.HAN CHECKED BY: C.Y.HONG		SHORT CIRCUIT AND DISCONNECTING CT'S (CT2,3,4) & CT SECONDARY BOX TERMINAL/LABELLING						NEXT 47A	
			DATE STARTED 10.JULY.12 DATE COMPLETED _____		LCC SCHEMATICS FOR D120 BUS SECTION BAY		CONTRACT NO. 11131113/00		INDEX P		REV. NO. 00	
			OPRG. DEPT. _____ ENG. DEPT. _____		RIYADH SAUDI ARABIA		PLANT NO. C421		DRAWING NUMBER CA -323947			

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AS-BUILT

BY

DATE

DRAWN BY: D.H.HAN CHECKED BY: C.Y.HONG

DATE STARTED: 10.JULY.12 DATE COMPLETED:

OPRG. DEPT. ENG. DEPT.

SEC-COA 132kV/13.8kV SUBSTATION #8709

SHORT CIRCUIT AND DISCONNECTING CT'S(CT2,3,4) & CT SECONDARY BOX TERMINAL/LABELLING

LCC SCHEMATICS FOR D120 BUS SECTION BAY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid sa		SHEET NO. 47A of 47A
CONTRACT NO.	INDEX	PLANT NO.	DRAWING NUMBER	REV. NO.	REV. NO.	REV. NO.
11131113/00	P	C421	CA -323947	00	00	00

SEC-D (2004/10)

EDMS

VECTOR

SECE00

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